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Vol. 942 Number 3

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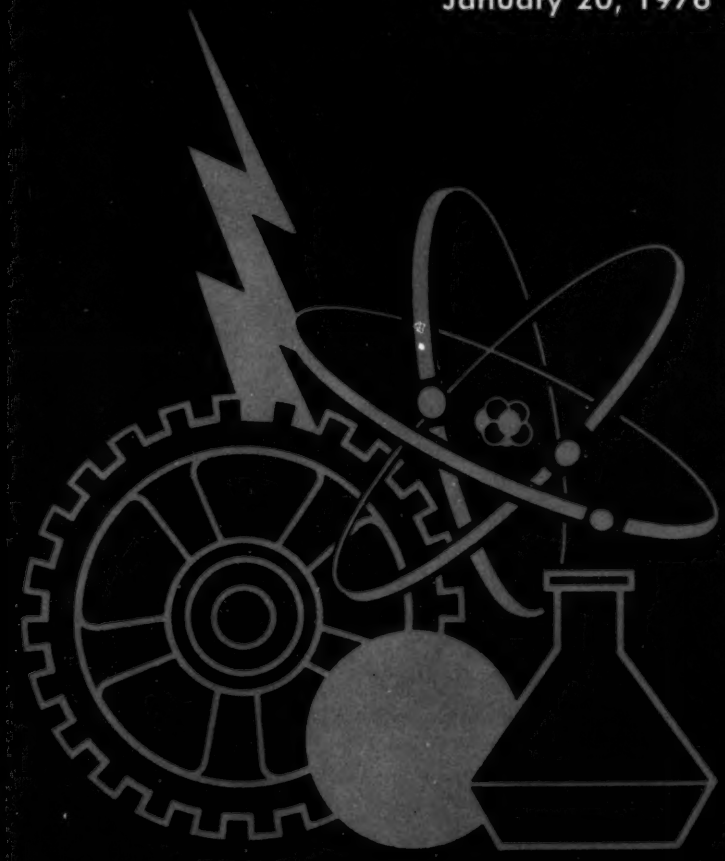
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 20, 1976



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and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 20, 1976 Volume 942 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum, foreign mailing $85.55 additional; single copies $6.60 each.

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CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examing group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

Certificate of Mailing of Correspondence

Increasing problems caused by delays in the delivery of papers to the Office by mail within the time periods set for response by applicants have caused renewed efforts within and outside the Patent and Trademark Office to seek a suitable solution. Helpful suggestions have been received from a number of individuals and bar associations. The following proposal, which is hereby published for comment by all interested parties, appears to provide a simple and effective method of alleviating most of the problems resulting from mail delays and to be within the present statutory authority of the Commissioner.

The proposed practice on which comments are invited would provide that correspondence in pending applications and proceedings would be timely if (1) deposited in the mails within the period or time set by the Office, and (2) accompanied by a suitable declaration.

The present practice of treating a response or other correspondence as effective only upon actual receipt in the Patent and Trademark Office follows a decision by Commissioner Moore in *In re James*, 1913 C.D. 89. At that time the period for response to an Office action was one year, in contrast to the three month shortened statutory period which is usual today. Nothing in the statute appears to prevent the adoption of a different practice which takes into account the difficulties currently arising from shortened periods for response and uncertainties of the mails.

It is proposed that this change in practice be accomplished by Commissioner's notice rather than by changing the Rules of Practice (Title 37 of the Code of Federal Regulations). Comments are, however, also invited as to whether it would be preferable to adopt the proposed practice by rule change.

The proposed practice would not be applicable to the filing of patent or trademark applications. These are excluded because of the priority rights, domestic and international, which are involved.

The proposal contemplates the issuance of an Official Gazette Notice stating that:

Effective _____, in any case where a time is set for taking action relative to any pending patent or trademark application or in any patent or trademark proceeding pending before the Patent and Trademark Office, correspondence will be considered as having been timely filed if it is

(1) deposited prior to the expiration of the period set for response (a) with the United States Postal Service as first class mail or (b) outside the United States with a governmental postal service as air mail, in an envelope addressed to the "Commissioner of Patents and Trademarks, Washington, D.C. 20231," and
(2) accompanied by a statement in the form of a declaration under 37 CFR 1.68 indicating the name of the person depositing the correspondence in the mail, the location of the deposit in the mail, and date of deposit in the mail.

In the event that correspondence is mailed and the application is later held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice because such correspondence was not received in the Patent and Trademark Office, the correspondence will be considered timely and the Office action will be vacated if the party who forwarded such correspondence, promptly after becoming aware of the Office action, informs the Office of the previous mailing of the correspondence, supplies an additional copy of the previously mailed correspondence and declaration of mailing, and includes a new declaration which attests again to the previous mailing of the correspondence and declaration.

A suggested format for the declaration under 37 CFR 1.68 to be included on the first page of any correspondence is shown below:

I hereby certify that this correspondence is being deposited with:

☐ the United States Postal Service as first class mail
☐ a governmental postal service other than the United States Postal Service as air mail

in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____
Date

from _____
Location of mailing (deposit in the mail)

by _____
Name of person actually depositing the correspondence in the mail

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date _____ _____
Signature of applicant or assignee, or signature and Registration Number of Registered Representative

* * * * *

Any person wishing to comment upon the proposed practice should address the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Comments should be received by March 16, 1976.

C. MARSHALL DANN,
Dec. 23, 1975. *Commissioner of Patents and Trademarks.*

Substitute Powers of Attorney

The Patent and Trademark Office has recently received correspondence in certain applications under the title "Substitute Power of Attorney" wherein the principal attorney of record attempted to name other attorneys as his substitute in those applications.

Since the power of the principal attorney may be revoked, or terminated as by his death, revocation or termination of said power of the principal attorney will also terminate the power of those appointed by him. Thus, a principal attorney may appoint an associate attorney whose power terminates with that of the principal, but he may not appoint a "substitute" and any attempt by the principal to appoint a "substitute" attorney whose power survives his own shall not be recognized by the Office.

WILLIAM FELDMAN,

Dec. 17, 1975. *Deputy Assistant Commissioner for Patents.*

PATENT NOTICES

Certificates of Correction for the Week of Jan. 20, 1976

Re. 28,473	3,882,410	3,902,905	3,909,688
3,620,700	3,884,322	3,902,981	3,912,521
3,774,993	3,884,729	3,903,037	3,912,684
3,776,969	3,885,012	3,905,488	3,912,758
3,798,553	3,886,064	3,905,751	3,912,820
3,822,272	3,891,648	3,905,821	3,912,988
3,825,527	3,892,808	3,905,924	3,913,020
3,829,433	3,894,865	3,906,587	3,913,174
3,835,919	3,895,352	3,906,819	3,913,248
3,840,496	3,895,969	3,907,021	3,914,408
3,843,558	3,895,987	3,907,063	3,914,439
3,844,201	3,896,189	3,907,142	3,914,627
3,847,856	3,896,673	3,907,172	3,914,802
3,853,389	3,897,386	3,907,693	3,914,960
3,853,719	3,897,927	3,907,706	3,915,303
3,855,273	3,898,291	3,907,927	3,916,296
3,861,833	3,898,297	3,908,932	3,916,363
3,864,395	3,899,958	3,909,160	3,916,364
3,869,515	3,901,529	3,909,261	3,916,422
3,880,819	3,901,646	3,909,600	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 20, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Aso; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-3-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition: Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-13-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-20-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-17-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-18-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-3-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-1-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants: Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange: Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-19-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-27-75

Expiration of patents: The patents within the range of numbers indicated below expire during January 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,866,973 to 2,871,478 inclusive
Plant Patents..... Numbers 1,792 to 1,804 inclusive

PATENT APPLICATIONS

PUBLISHED JANUARY 20, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before April 20, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 356,187

TIME DELAY FUSE

Donald E. Bowman, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Division of Ser. No. 149,483, Oct. 30, 1961, Pat. No. 3,897,731. This application Mar. 31, 1964, Ser. No. 356,187

Int. Cl.² F42B *3/10*

U.S. Cl. 86—1 R **3 Claims**

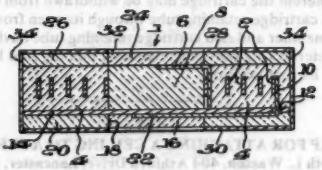
References Cited

UNITED STATES PATENTS

2,164,509	7/1939	Fleming et al.	102/27
2,416,639	2/1947	Pearsall	102/27

FOREIGN PATENTS OR APPLICATIONS

746,843	3/1956	United Kingdom	102/27



1. A method of making a time delay fuse comprising the steps of overlaying a fuse strip consisting essentially of a paper formed of non-combustible insulating fibers filled with a combustible composition which evolves substantially no gas on burning with a backing strip wider than said fuse strip consisting essentially of a paper formed from noncombustible insulating fibers, both ends of said fuse strip extending beyond and normal to said backing strip, winding said overlaid fuse strip in a flat spiral around the circumference of a cylindrical core formed from non-combustible insulating fibers to form a cylindrical body having said both fuse strip ends exposed on the surface of said core while maintaining a high water content in said fuse strip, backing strip and core, axially compressing said body to form a compact, and drying said compact.

B 469,947

APPARATUS TO TRANSFORM A SINGLE LASER BEAM INTO TWO PARALLEL BEAMS OF ADJUSTABLE SPACING AND INTENSITY

Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed May 15, 1974, Ser. No. 469,947

Int. Cl.² G02B *27/10, 27/28*

U.S. Cl. 350—173 **2 Claims**

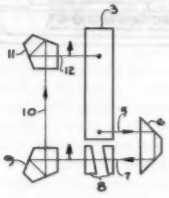
References Cited

UNITED STATES PATENTS

1,505,877	8/1924	Eppenstein	356/16
3,817,624	6/1974	Martin	350/173 X

OTHER PUBLICATIONS

Hoffman, Article in IBM Technical Disclosure Bulletin, Vol, 8, No. 11, Apr., 1966, p. 1554.



1. A device for converting a beam of collimated light into two parallel beams comprising (a) a beam splitter which permits a first portion of said beam to pass through as a first output beam, and reflects a second portion of said beam onto (b) a roof prism to one side of said beam splitter for offsetting and reflecting said second portion of said beam, in a constant deviation fashion, clear of and to the other side of said beam splitter onto (c) a fixed pentaprism for reflecting said second portion of said beam, in a constant deviation fashion, by 90° onto (d) a moveable pentaprism positioned to reflect, in a constant deviation fashion, by 90°, said second portion of said beam onto said other side of said beam splitter to produce a second output beam in approximate parallelism with said first output beam, whereby the distance between said two output beams can be adjusted from coincidence to substantially the full length of said beam splitter by moving the moveable pentaprism toward or away from the fixed pentaprism, and (e) counter rotating wedges, in the path of said second portion of said beam in advance of said moveable pentaprism, adjustable to ensure effective parallelism between said two output beams.

B 506,566

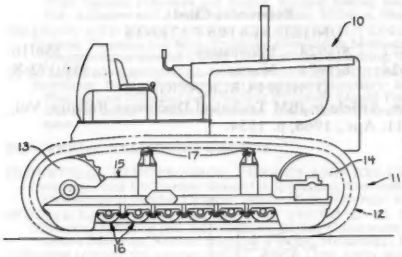
CUSHIONED TRACK ROLLER FOR TRACK-TYPE VEHICLES

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 16, 1974, Ser. No. 506,566
Int. Cl.² B62D 55/16
U.S. Cl. 305—27 12 Claims

References Cited
UNITED STATES PATENTS

2,952,495	9/1960	Herr	308/15
3,484,139	12/1969	Danner	305/27
3,630,581	12/1971	Gostomski	305/27
3,695,737	10/1972	Alexander	267/63 A
3,777,672	12/1973	Schneider	267/63 A
3,826,325	7/1974	Purcell	180/9.5



1. In a track-type vehicle of the type having a pair of longitudinally extending sub-frames disposed on either side thereof and an endless track entrained about each of said sub-frames to engage a plurality of longitudinally spaced rollers, each rotatably mounted on a shaft secured to a respective sub-frame, the improvement wherein each end of said shaft is mounted in cushioned mounting means comprising

a pair of longitudinally spaced support members secured to each sub-frame to extend downwardly thereon in straddling relationship with respect to each end of said shaft,

a bracket mounted on each end of said shaft and extending longitudinally between said support members,

elastomeric cushioning means disposed axially between an outboard side of each of said brackets and said sub-frame, and

retaining means supporting ends of said bracket on said support members and cooperating with said cushioning means for permitting slight universal movement of said bracket relative to said sub-frame.

B 515,303

CAULKING GUN CARTRIDGE LATCH

Michael Joseph Pedone, Jr., Towson, and Hanspeter Ehrenfried Beisch, Belair, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

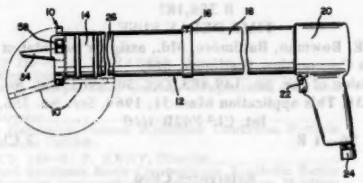
Filed Oct. 16, 1974, Ser. No. 515,303
Int. Cl.² G01F 15/00
U.S. Cl. 222—325 10 Claims

References Cited
UNITED STATES PATENTS

2,607,627	8/1952	Gregg et al.	222/325
3,315,990	8/1967	Kramer	285/321 X
3,389,838	6/1968	Morra et al.	222/326 X
3,568,892	3/1971	Burk	222/327

FOREIGN PATENTS OR APPLICATIONS

133,080	8/1902	Germany	215/279



1. A portable, power-operated cartridge dispensing device comprising a housing having a dependent handle and a power cylinder tube extending forwardly thereof, an elongated cartridge retaining tube extending forwardly of said power cylinder tube and having an open front end for free insertion and removal of a cartridge, an integral latch member pivoted by fixed pivot means on the front end of said cartridge retaining tube and outside its confines, said latch member being pivotable from a first position obstructing said open front end of said cartridge retaining tube wherein a cartridge in said retaining tube is prevented from moving out the front end thereof, to a second position clear of said cartridge retaining tube front end wherein the cartridge may be withdrawn from or inserted in said cartridge retaining tube through its open front end, said latch member and said cartridge retaining tube having cooperable interlocking portions releasably holding said latch member in its first position.

B 522,354

STRAP FOR ATTACHING A CEILING TO A STEEL DECK

Kenneth L. Wasson, 404 Ashford Drive, Lancaster, Pa. 17601

Filed Nov. 11, 1974, Ser. No. 522,354
Int. Cl.² E04B 5/52
U.S. Cl. 52—484 2 Claims

References Cited
UNITED STATES PATENTS

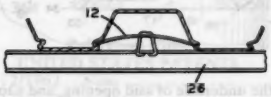
1,213,649	1/1917	Hunter	52/710 X
2,762,398	9/1956	Adam	52/710 X
3,102,610	9/1963	Shelby	52/484
3,266,202	8/1966	Furer	52/710 X
3,808,763	5/1974	Olinger	52/22
3,812,636	5/1974	Albert	52/630

FOREIGN PATENTS OR APPLICATIONS

537,594	5/1955	Belgium	52/484

2. The combination of a structural roof component and a ceiling system, wherein; said structural roof component being formed with a fluted roof deck structure which has a corrugated-type structure with a plurality of parallel extending flutes having their bottoms in a single plane and having therebetween a plurality of gaps, along both edges of the bottom of said flutes there being positioned ridges which form recessed

surfaces facing towards said gaps, said ceiling system in combination therewith having a suspension runner for a suspended ceiling system, said suspension runner being fastened to said roof deck through the use of a support means comprising a strap member and a hanger member, said strap member being longer than the distance between two adjacent ridges and having its ends engaged in two adjacent ridges facing each



other across a single gap and said strap member being bowed with a concave configuration facing towards said suspension runner, said hanger member being a generally U-shaped member connected to the strap member and said suspension runner is placed up against the bottom of the flutes of the roof deck structure and said hanger member clamps said suspension runner up against the bottom of the flutes of the roof deck structure.

B 526,445

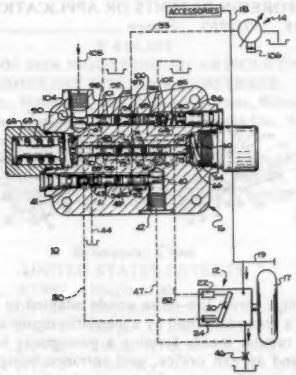
AUXILIARY FRONT WHEEL DRIVE

Loren L. Alderson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Nov. 22, 1974, Ser. No. 526,445
Int. Cl.² F16H *39/46*
U.S. Cl. 60—422 **8 Claims**

References Cited
UNITED STATES PATENTS

3,339,660	9/1967	Budzich	60/420 X
3,354,978	11/1967	Budzich	60/427 X



1. An auxiliary hydraulic drive system on a vehicle principally driven by other means, the vehicle having a primary hydraulic system including an engine driven variable displacement pressure compensated pump which supplies the various conventional accessories of the vehicle, the improvement comprising:

a variable displacement motor having a pressure compensating control means connected in driving relation with the primary pump, the motor driving at least one nonmechanically driven wheel on the vehicle, the pressure compensator means on the motor being set at a pressure level less than the pressure compensating level on the primary pump; thereby destroking the motor when the system pressure drops below said lesser value, the lesser pressure compensating level of the motor being sufficient to supply the conventional accessories of the vehicle whereby said accessories have a priority requirement over the drive motor.

B 537,903

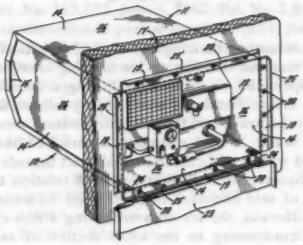
WATER HEATER FOR RECREATIONAL VEHICLES

Donald M. White, c/o Atwood Vacuum Machine Company, 1400 Eddy Ave., Rockford, Ill. 61101

Filed Jan. 2, 1975, Ser. No. 537,903
Int. Cl.² F24H *1/00*
U.S. Cl. 126—350 A **2 Claims**

References Cited
UNITED STATES PATENTS

1,702,775	2/1929	Hauser	126/350 A
3,404,539	10/1968	Laing	62/263 X
3,868,060	2/1975	Mitchell	237/12.3 B



1. A water heater comprising a box-like case, a water heating unit housed within said case, said case being formed by a top panel, by a substantially parallel bottom panel and by two side panels extending between and substantially perpendicular to said top and bottom panels, each of said panels being made of sheet metal and each being defined by a main body and by a forward marginal portion initially disposed substantially in the plane of the main body, substantially rectangular louvers struck outwardly from each panel and spaced from one another along a row located adjacent the junction between said main body and said forward marginal portion and extending parallel to the forward margin of said panel, each louver leaving a three-edged slit extending through the panel and each having a rear edge and two end edges spaced outwardly from the respective edges of the respective slit so as to establish a line of bending extending between the adjacent end edges of adjacent slits and alined with the rear edges of the slits to enable said forward marginal portion to be bent outwardly at right angles to said main body along said line, and the forward margin of each louver being integrally joined to the forward margin of the respective slit to enable the louver to move with said forward marginal portion and substantially close the slit when the forward marginal portion is bent outwardly at right angles to said main body.

B 564,314

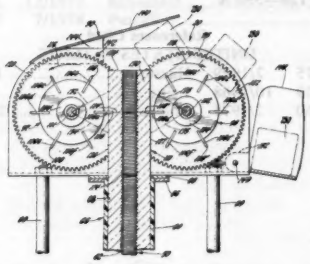
VERTICAL TUBE ICE MAKER

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1975, Ser. No. 564,314
Int. Cl.² F25C 1/06, 1/12
U.S. Cl. 62—353 5 Claims

References Cited
UNITED STATES PATENTS

2,542,891	2/1951	Bayston	62/353 X
3,861,163	1/1975	Carpenter	62/353 X
3,896,631	7/1975	Morrison	62/71



1. In an automatic ice piece maker, a vertically extending tubular member defining an ice forming chamber having an upper open end, said chamber having a non-circular cross section, means forming a water supply inlet to said chamber adjacent the lower end thereof, refrigeration means for freezing the water in said chamber, a threaded shaft rotatably mounted within said chamber, said shaft threads having their major diameter in sufficiently spaced relation to the inside surface of said chamber to permit the formation of an ice column therein, the ice column having a non-circular cross section conforming to the cross section of said chamber, whereby the ice column is locked against rotational movement in said chamber; internal threads being formed by the ice column in mating relation with said shaft threads, means for rotating said shaft about its axis of rotation whereby the ice column is moved vertically upward out of said chamber upper open end, and ice harvesting means above said chamber open end operative for successively removing a top portion from the upwardly driven ice column to produce substantially uniform ice pieces with each ice piece having a non-circular cross section substantially conforming to the cross section of said chamber.

B 578,447

PUSH-IN EASY OPENING CONTAINER

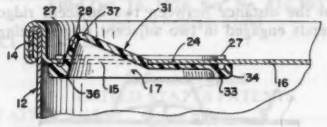
John S. Bozek, Chicago, and Harry A. Peyser, Olympia Fields, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 513,433, Oct. 9, 1974, abandoned, which is a continuation of Ser. No. 365,003, May 29, 1973, abandoned. This application May 19, 1975, Ser. No. 578,447
Int. Cl.² B65D 43/14, 51/04
U.S. Cl. 220—337 11 Claims

References Cited
UNITED STATES PATENTS

3,731,835	5/1973	Hawkins et al.	220/359 X
3,871,550	3/1975	Chiappe	220/339
3,889,842	6/1975	Bennett	220/268

1. An easy opening end closure for a container comprising a metal panel, an opening formed in said panel, a closure made from plastic material underlying said opening and having a closure flap, an attachment band hingedly attached to said flap and permanently bonded to the underside of said panel, marginal edge portions about said flap releasably



bonded to the underside of said opening, and a tongue integral with said panel extending into said opening from the edge along which said attachment panel is permanently bonded, said tongue being permanently secured to said flap.

B 586,215

VARIABLE TWO STAGE AIR NOZZLE

Alain Frochaux, Boston, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

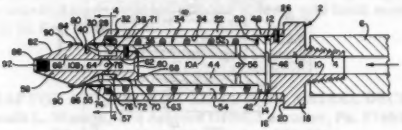
Filed June 12, 1975, Ser. No. 586,215
Int. Cl.² B05B 7/08, 1/30; F01N 1/10, 1/14
U.S. Cl. 239—424 15 Claims

References Cited
UNITED STATES PATENTS

2,293,181	8/1942	Terman	181/71 X
2,334,263	11/1943	Hartwell	181/42 X
2,797,964	7/1957	Alexander	239/422 X
3,117,726	1/1964	Schoberg	239/291
3,318,534	5/1967	Stolteben	239/291
3,628,737	12/1971	Norton	239/DIG. 7
3,735,778	5/1973	Garnier	239/DIG. 7
3,794,137	2/1974	Tydorescu et al.	239/DIG. 7
3,795,288	3/1974	Pall	181/71 X
3,829,020	8/1974	Stearns	239/265.13
3,859,205	1/1975	Reba et al.	239/DIG. 7

FOREIGN PATENTS OR APPLICATIONS

1,408,538	7/1965	France	239/291



1. A high-thrust low-noise nozzle adapted to effect movement of a secondary fluid by a pressurized primary fluid comprising, tubular means forming a passageway having an entrance and an exit orifice, said entrance being adapted for connection to a source of pressurized primary fluid, at least one port communicating with the passageway between said entrance and exit orifice, means cooperating with said port for directing flow of primary fluid from said port along the outside of said tubular means in a direction so as to induce flow of a secondary fluid along the outside of said tubular means toward said exit, noise-reducing means positioned in said passageway between said exit orifice and said port for effecting substantially laminar flow of the stream of pressurized primary fluid discharged from said exit orifice, said noise-reducing means creating sufficient back pressure to force some of the pressurized primary fluid to flow out of said passageway via said port, and means for varying the length of the outside of said tubular means over which secondary fluid flows as a function of the input flow of said primary fluid.

B 370,309

CORROSION INHIBITOR COMPOSITION

Martin J. Culver, and Howard R. Stopper, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed June 15, 1973, Ser. No. 370,309
Int. Cl.[2] C23F *11/14, 11/12;* C11D *7/30;* C23G *5/02*
U.S. Cl. 252—364 **15 Claims**

References Cited
UNITED STATES PATENTS

3,113,155	12/1963	Sims	252/364
3,546,305	12/1970	Archer	252/364
3,609,091	9/1971	Harden et al.	252/364
3,676,355	7/1972	Vuillemenot	252/364

FOREIGN PATENTS OR APPLICATIONS

1,546,120	7/1971	Germany	252/364

4. An aqueous composition consisting essentially of a chlorinated hydrocarbon solvent, water present in greater than trace amounts, and at least 2 weight percent based upon the weight of said solvent-water composition of a three component corrosion inhibitor composition consisting essentially of morpholine, ammonium benzoate, and a member selected from the group consisting of cyclohexene, nitropropane, and cyclopentene, wherein the weight ratio of morpholine to ammonium benzoate to said member is 1:1:2 or 4:1:1.

8. An aqueous composition consisting essentially of a chlorinated hydrocarbon solvent, water present in greater than trace amounts, and at least 2 weight percent based upon the weight of said solvent-water composition of a three component corrosion inhibitor composition consisting essentially of ammonium benzoate, butylene oxide, and a member selected from the group consisting of isopropylamine and triethylamine, wherein the weight ratio of ammonium benzoate to butylene oxide to said member is 1:2:1 or 1:1:4.

B 414,481

METHODS FOR MOUNTING AN ARTICLE ON AN ADHERENT SITE ON A SUBSTRATE

Lyle J. Hentz, Whitehall, and Willard G. Otto, Schnecksville, both of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 374,436, June 28, 1973, abandoned. This application Nov. 9, 1973, Ser. No. 414,481
Int. Cl.[2] B32B *7/14, 31/20;* H01L *27/12;* H05K *3/30*
U.S. Cl. 156—73.6 **9 Claims**

References Cited
UNITED STATES PATENTS

3,465,874	9/1969	Hugle et al.	206/330
3,472,356	10/1969	Reppert	221/157
3,559,819	2/1971	Large	214/1 C
3,645,581	2/1972	Lasch, Jr. et al.	302/2 R
3,663,326	5/1972	Wanesky	156/3
3,669,333	6/1972	Coucoulas	228/3
3,670,396	6/1972	Lindberg	29/471.3
3,752,717	8/1973	White	156/17
3,776,394	12/1973	Miller	214/1 R

1. A method of mounting an article on a site, having an adherent coating, on a substrate, which comprises the steps of:

a. placing the article on a member associated with a locating and orienting cavity;

b. engaging the article intermittently with the walls of the cavity while lowering the member and the article into the cavity to locate and orient the article without the use of a liquid for supporting the article;

c. aligning the site on the substrate in relation to the cavity; and

d. raising the member with the article thereon to engage the article with the site and thereby mount the article on the site.

B 426,274

SEPARATION OF CYCLIC COMPOUNDS WITH MOLECULAR SIEVE ADSORBENT

John A. Hedge, Wilmington, Del., assignor to Sun Ventures Inc., St. Davids, Pa.

Division of Ser. No. 263,372, June 6, 1962, Pat. No. 3,840,610, which is a continuation-in-part of Ser. No. 7,273, Jan. 30, 1970, Pat. No. 3,668,267, and a continuation-in-part of Ser. No. 207,870, Dec. 14, 1971, and a continuation-in-part of Ser. No. 256,863, May 25, 1972, Pat. No. 3,772,399. This application Dec. 19, 1973, Ser. No. 426,274
Int. Cl.[2] C07C *7/13*
U.S. Cl. 260—674 SA **5 Claims**

References Cited
UNITED STATES PATENTS

2,988,503	6/1961	Milton et al.	260/666
3,126,425	3/1964	Eberly et al.	260/674
3,130,007	4/1964	Breck	252/455
3,485,748	12/1969	Eberly et al.	208/310
3,558,730	1/1971	Neuzil	260/674
3,626,020	12/1971	Neuzil	260/674
3,663,638	5/1972	Neuzil	260/674
3,665,046	5/1972	Rosset	260/674
3,668,266	6/1972	Chen et al.	260/674
3,668,267	6/1972	Hedge	260/674
3,686,343	8/1972	Bearden et al.	260/674
3,699,182	10/1972	Cattanach	269/674
3,734,974	5/1973	Neuzil	260/674
3,840,610	10/1974	Hedge	260/674

1. A process for separating two structurally similar cyclic hydrocarbons selected from the group consisting of benzene, toluene and xylenes, said process comprising:

A. contacting a fluid feed mixture comprising said cyclic hydrocarbons with a solid adsorbent comprising a partially dehydrated, substantially crystalline alumino-silicate sodium Y zeolite having a critical pore diameter greater than about 6A, the ratio Al/Si of the alumino-silicate framework of the zeolite being in the range of 0.65–0.2, the zeolite having been partially dehydrated by exposure to a temperature in the range of 80°–300°C., whereby there is obtained a rich adsorbent containing an adsorbate which is richer in one said cyclic hydrocarbon than was said fluid feed mixture, and a raffinate product which contains less of the one said cyclic hydrocarbon than did said fluid feed mixture;

B. separating said raffinate product from said rich adsorbent and,

C. removing the one said cyclic hydrocarbon from said rich adsorbent.

B 431,072
WATER-RESISTANT ASBESTOS-CEMENT

Robert C. Pomerhn, Cheektowaga, and Robert M. Johnson, Kenmore, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,072
Int. Cl.² D21F *11/00*
U.S. Cl. 162—133 **6 Claims**

References Cited
UNITED STATES PATENTS

1,804,740	5/1931	Buczkowski	162/155
1,859,414	5/1932	Stevenson et al.	162/171
1,925,584	9/1933	Fisher	162/171
2,335,722	11/1943	Adams	162/145
2,555,401	6/1951	Fasold et al.	162/155
3,087,851	4/1963	Beuscher et al.	162/171
3,095,346	6/1963	Sfiscko et al.	162/154
3,300,372	1/1967	Bauer	162/145
3,344,015	9/1967	Neal et al.	162/154
3,509,020	8/1970	Gelsomino	162/133

1. The method of making an asbestos-cement product of improved water resistance comprising the steps of forming an aqueous slurry of, by weight, from 30 to 50 parts of Portland cement, 10 to 25 parts of asbestos fibers, 10 to 50 parts of inorganic fillers and 2 to 10 parts of an emulsion of asphalt in water, based on an asphalt content in said emulsion of about 60%, said asphalt in said emulsion having a softening point of at least about 150°F and being present in said emulsion in forms substantially all smaller than 10 microns, thoroughly mixing the ingredients of said slurry at a temperature of no more than 110°F, continuously feeding portions of said slurry to means for forming a web therefrom adding a cationic retention aid to the portion of said slurry being fed to said web forming means and subsequently adding an anionic flocculating agent to said slurry being fed to said web forming means, forming a web from the solids of said slurry, forming a laminated product from a plurality of said webs, and curing and hardening said product.

B 474,573
PHENYL SULFONYL, BENZYLTHIOCHLOROMETHANES

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 399,664, Sept. 21, 1973, Pat. No. 3,839,403, which is a division of Ser. No. 139,978, May 3, 1971, Pat. No. 3,792,088. This application May 30, 1974, Ser. No. 474,573
Int. Cl.² C07C *149/34*
U.S. Cl. 260—609 E **4 Claims**

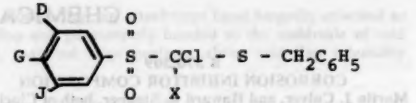
References Cited
UNITED STATES PATENTS

3,742,066	6/1973	Tsuchihashi et al.	260/609 E

OTHER PUBLICATIONS

Index of Chemicus, 30, pp. 99571 (1968).

1. A substituted alpha-chloro-benzyl sulfide of the formula



wherein X is hydrogen or chloro and D, G and J are hydrogen, bromo, chloro or alkyl.

B 476,837
METHOD OF TREATING A LAYER OF SILICON DIOXIDE

Murray Henderson Woods, and Richard Williams, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 476,837
Int. Cl.² B05D *3/06*
U.S. Cl. 427—39 **6 Claims**

References Cited
UNITED STATES PATENTS

3,556,879	1/1971	Mayer	148/191
3,698,945	10/1972	Yokozawa et al.	117/201
3,711,324	1/1973	Glendinning et al.	357/52
3,755,092	8/1973	Antula	204/164

1. A method of treating a layer of silicon dioxide having a pair of opposite surfaces comprising the steps of:
coating one surface of said layer with a solution of a solute of an ionic fluoride compound in a solvent,
drying said solution to remove said solvent, whereby said solute of ionic fluoride compound remains on said one surface, and
directing a corona discharge onto said one surface between a negative electrode spaced from the coated surface of said layer, and the other surface of said layer which is connected to a source of potential more positive than said negative electrode to drive fluoride ions of said compound into said layer.

B 526,510
2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

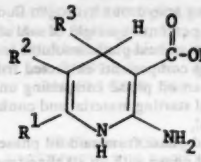
Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 390,194, Aug. 21, 1973, Pat. No. 3,862,162. This application Nov. 25, 1974, Ser. No. 526,510
Claims priority, application Germany, Aug. 31, 1972, 2242786
Int. Cl.² C07D *213/55*
U.S. Cl. 260—294.8 D **2 Claims**

References Cited
UNITED STATES PATENTS

3,775,422	11/1973	Bossert et al.	260/294.9
3,799,934	3/1974	Meyer et al.	260/295.5 R
3,799,936	3/1974	Meyer et al.	260/295.5 R

1. A compound of the formula:



wherein R^1 is lower alkyl or phenyl;
R^2 is pyridyl, naphthyl; thienyl or furyl;
R^3 is hydrogen or lower alkyl; and
R^4 is lower alkyl, alkenyl of 2 to 4 carbon atoms, or lower alkyl.

B 513,280

APPARATUS FOR QUENCHING COKE PUSHED FROM COKE OVENS

Hugo Lewandowski, and Gerd Friedrich Fautz, both of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

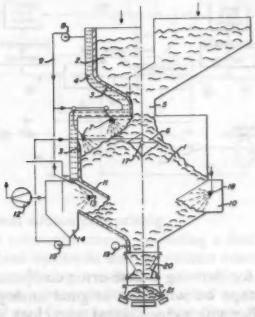
Filed Oct. 9, 1974, Ser. No. 513,280
Claims priority, application Germany, Oct. 18, 1973, 2352296
Int. Cl.² C10B *39/08, 39/12*
U.S. Cl. 202—227 **7 Claims**

References Cited
UNITED STATES PATENTS

976,580	11/1910	Krause	202/227
1,006,281	10/1911	Ries	202/227
3,721,609	3/1973	Spindeler	202/230
3,846,250	11/1974	Knappstein et al.	202/230

FOREIGN PATENTS OR APPLICATIONS

573,867	4/1933	Germany	202/227



1. Apparatus for quenching incandescent coke pushed from a coke oven comprising,

a quenching vessel having a top portion with an inlet opening and a bottom portion with an outlet opening,

valve means in said bottom opening to control the flow of quenched coke therethrough and provide a bed of quenched coke in said quenching vessel,

a collector vessel having a bottom outlet opening connected to said quenching vessel top inlet opening, said collector vessel arranged to receive incandescent coke pushed from a coke oven and introduce said incandescent coke at a predetermined rate into said quenching vessel,

first water spray means positioned in said quenching vessel adjacent said top portion, said first water spray means arranged to quench said incandescent coke and form quench water vapors adjacent said quenching vessel top portion,

suction means in said quenching vessel adjacent said quenching vessel bottom portion arranged to draw said quench water vapors downwardly through said bed of quenched coke,

an annular passage in said quenching vessel adjacent said quenching bottom portion, said suction means connected to said annular passage and arranged to draw said quenched water vapors into said annular passage, and

second water spray means positioned in said annular passage and arranged to precipitate particulate matter in said quenched water vapors.

B 535,076

METHOD FOR INCREASING THE SUCROSE CONTENT OF GROWING PLANTS

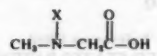
Ernest G. Jaworski, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1974, Ser. No. 535,076
Int. Cl.² A01N *9/24*
U.S. Cl. 71—113 **7 Claims**

References Cited
UNITED STATES PATENTS

3,282,987	11/1966	Ellis	71/113
3,712,804	1/1973	Muller et al.	71/113
3,853,530	12/1974	Franz	71/76

1. A method for increasing the sucrose content of sugar cane plants which comprises applying to said plants, from about 2 to 8 weeks prior to harvest, an effective amount of a compound of the formula



wherein X represents hydrogen or methyl, and the non-phytotoxic, agriculturally acceptable salts thereof.

B 536,675

PLANT GROWTH REGULATORS

Gerhard H. Alt, Creve Coeur, and John E. Franz, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1974, Ser. No. 536,675
Int. Cl.² C07D *307/90*
U.S. Cl. 260—343.3 **3 Claims**

References Cited
OTHER PUBLICATIONS

Roderick, Chem. Abstracts, Vol. 60 (1964) p. 13179h.
Beno et al., Chem. Abstracts, Vol. 78 (1973) p. 28896f.
Sauers et al., Chem. Abstracts, Vol. 78 (1973) p. 42446r.

1. A compound selected from the group consisting of 3-[(o-halo-m-trifluoromethylphenyl)imino]-phthalide and 3-[(o, m-dimethoxyphenyl)imino]-phthalide.

B 546,295

PROCESS FOR THE PRODUCTION OF LOW MOLECULAR WEIGHT CYCLOALIPHATIC DIGLYCIDYL ESTERS

Klaus Prater, Krefeld-Bockum, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Feb. 3, 1975, Ser. No. 546,295

Claims priority, application Germany, Feb. 8, 1974, 2405933

Int. Cl.² C07D 301/30

U.S. Cl. 260—348.6 1 Claim

1. A process for the production of low molecular weight, low viscosity diglycidyl esters of cycloaliphatic dicarboxylic acids by reacting the cycloaliphatic dicarboxylic acids with excess epihalohydrin in the presence of a catalyst at 80° to 115°C, followed by dehydrohalogenation of the 3-halogen-2-hydroxy propyl carboxylic acid esters formed with aqueous alkali, wherein secondary and/or tertiary o-alkali phosphate is used as catalyst in a quantity of from 0.5 to 4% by weight, based on the dicarboxylic acid.

B 657,438

RUBBER CONTAINING ACID-TREATED OILS AND ITS PREPARATION

Abraham Schneider, Philadelphia, and Archibald P. Stuart, Media, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 547,670, May 4, 1966, which is a continuation of Ser. No. 186,825, April 6, 1962, abandoned, which is a continuation of Ser. No. 822,155, June 22, 1959, abandoned, which is a continuation-in-part of Ser. No. 409,478, Feb. 10, 1954, abandoned. This application May 29, 1967, Ser. No. 657,438

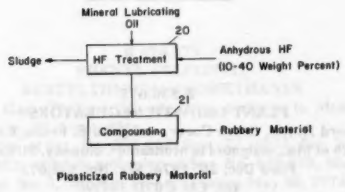
Int. Cl.² C08K 5/01; C10G 17/02

U.S. Cl. 260—33.6 AQ 2 Claims

References Cited

UNITED STATES PATENTS

2,449,463	9/1948	Evering et al.	196/13
2,778,807	1/1957	Boggs et al.	260/33.6



1. Process for preparing rubber compositions which comprises admixing a rubber selected from the group consisting of natural rubber, homopolymers of conjugated diolefins, and copolymers of conjugated diolefins with ethylenically unsaturated monomers, with mineral oil having at least 10 Wt. % aromatic compounds which has been obtained by

a. mixing a mineral oil starting material with an acidic reagent comprising anhydrous hydrogen fluoride in amount from 10 to 40 percent by weight of said starting material; thereby to form an acid phase insoluble in said mineral oil and containing components extracted from said starting material, and an oil phase comprising unextracted components of said starting material and containing dissolved acidic material,

b. separating said phase from said oil phase,

c. mixing said oil phase with an alkaline reagent to neutralize said dissolved acidic material and form neutralization products, and

d. separating said neutralization products from said oil phase.

B 427,883

TIMING-ERROR COMPENSATION FOR LOW-SPEED TAPE SYSTEMS

Thomas K. Naylor, Belmont, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 26, 1973, Ser. No. 427,883

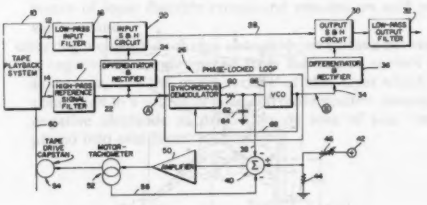
Int. Cl.² G11B 27/10

U.S. Cl. 360—27 13 Claims

References Cited

UNITED STATES PATENTS

3,347,997	10/1967	Woodruff	360/27
3,761,646	9/1973	Beauviala	360/26



1. A system for deriving a time-error compensated analog signal from a tape on which an original analog signal was recorded together with a clock signal, said clock signal having a frequency greater than the highest frequency component of interest in said original analog signal and the nominal speed of said tape being below one inch per second, comprising means for moving said tape and deriving therefrom the separate analog and clock signals recorded thereon, control means responsive to the clock signal derived from said tape for controlling the speed of said tape such that slow changes therein are compensated so that the average speed of said tape remains constant and for generating a corrected clock signal whose frequency is constant and equal to the average frequency of the clock signal derived from said tape, sampling means for taking samples of the analog signal derived from said tape in synchronism with the clock signal derived from said tape, and means controlled by the corrected generated clock signal for operating on successive samples taken by said sampling means at equally spaced intervals to reconstitute the original analog signal therefrom.

B 430,276

GATE CURRENT SOURCE

John Edwin Gersbach, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,276
Int. Cl.² G05F 3/08
U.S. Cl. 323—1 6 Claims

References Cited
UNITED STATES PATENTS

3,348,162	10/1967	Atkins	330/28
3,566,158	2/1971	Paine et al.	323/16 UX
3,681,623	8/1972	Hoffman et al.	323/4 X
3,754,181	8/1973	Kreitz et al.	323/1

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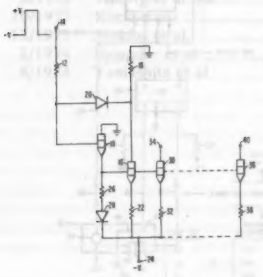
Dorler et al., T²L Controlled Current Source, IBM Technical Disclosure Bulletin, Vol. 15, No. 4, Sept. 1972, pp. 1102,1103.

Melnyk, Magnet Driver & Pulse-Width Controller, IBM Technical Disclosure Bulletin, Vol. 11, No. 4, Sept. 1968, p. 425.



1. A current source comprising

a current reference circuit, including a first transistor having a base electrode and an emitter electrode, a second transistor having a collector electrode, an emitter electrode and a base electrode coupled to the emitter electrode of said first transistor, a non-linear feedback circuit coupled between said collector electrode and the base electrode of said first transistor, an input terminal for receiving a voltage pulse coupled to the base electrode of said first transistor, a voltage supply source terminal and a first impedance coupling said voltage supply source terminal to the emitter electrode of said second transistor, and

a current sink circuit, including an output current terminal, a second impedance and a third transistor having a collector electrode, an emitter electrode and a base electrode coupled to the base electrode of said second transistor, said collector electrode of said third transistor being connected to said output current terminal and said emitter electrode of said third transistor being connected to said voltage supply terminal through said second impedance.

B 459,811

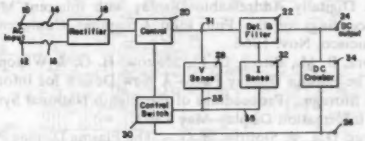
AC-DC VOLTAGE REGULATOR

Clyde Raymond Berry, Goleta, and Robert J. Cinzori, Santa Barbara, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 10, 1974, Ser. No. 459,811
Int. Cl.² G05F 1/56, 1/64
U.S. Cl. 323—17 9 Claims

References Cited
UNITED STATES PATENTS

3,323,034	5/1967	Dubin et al.	321/16
3,336,524	8/1967	Healey	323/22 SC
3,437,912	4/1969	Morris	323/DIG. 1
3,505,583	4/1970	Burkhardt et al.	323/22 T
3,711,761	1/1973	Watson	323/22 SC
3,790,879	2/1974	Milovancevic	323/22 T
3,796,919	3/1974	Johnson	323/20
3,809,999	5/1974	Smith	323/17



1. An efficient voltage regulation network for converting an unregulated AC input voltage into a regulated DC output voltage across a load, said network comprising:

a. a series pass control element for conducting current a given portion of each cycle of AC input voltage coupled thereto,

b. means connected to the output of said control element for detecting and filtering the output voltage thereof and providing a DC ripple voltage, said detection means disconnecting said control element from said load once each cycle of AC input voltage applied to said control element and preventing said control element from turning on more than one each cycle of AC input voltage applied thereto,

c. means connected to the output of said control element for sensing the changes in voltage thereat and for generating a control potential at a control node, and

d. means coupled between said control node and the input of said series pass control element and responsive to the voltage generated at control node for controlling the time during each cycle of AC input voltage that said series pass control element is conducting current to an output load, whereby said control element provides the required amount of output current for a varying load on said regulator and the latter, in turn, determines the varying level of voltage at the output of said series pass control element.

B 463,322

MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING DECREASED OPERATING VOLTAGES

Robert F. Schaufele, Okemos, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 67,604, Aug. 27, 1970, Pat. No. 3,846,670. This application Apr. 23, 1974, Ser. No. 463,322. The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.

Int. Cl.[2] H05B *37/00*

U.S. Cl. 315—169 TV 5 Claims

References Cited

UNITED STATES PATENTS

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2,919,361	12/1959	Tschakert	313/54
3,244,922	4/1966	Wolfgang	313/95
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3,599,029	8/1971	Martyny	313/489
3,846,670	11/1974	Schaufele	315/169 TV

FOREIGN PATENTS OR APPLICATIONS

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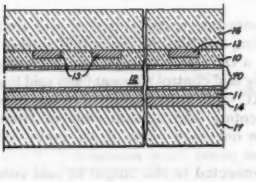
Holland, Vacuum Deposition of Thin Films –Published by Chapman & Hall, Ltd., London, p. 460, 1961.

Bitzer, D. L. and Slottow, H. G. –"The Plasma Display Panel–A Digitally Addressable Display with Inherent Memory" Proceedings of the Full Joint Computer Conference–San Francisco, Nov. 1966.

Arora, B. M., Bitzer, D. L., Slottow, H. G. & Wilson, R. H. –"The Plasma Display Panel–A New Device for Information and Storage," Proceedings of the Eighth National Sympsium for Information Display–May 1967.

Bitzer, D. L. & Slottow, H. G. –"The Plasma Display Panel–A New Device for Direct View of Graphics"–Conference on Emerging Concepts in Computer Graphics, Univ. of Ill., Nov. 1967.

Bitzer, D. L. & Slottow, H. G. –"Principles and Applications of the Plasma Display Panel," Proceedings of the Oar Research Applications Conference Office of Aerospace Research, Arlington, Va., Mar. 1968–also Proceedings of Microelectronics Symposium, I.E.E.E., 6/68.



1. In a gaseous discharge display/memory device characterized by an ionizable gaseous medium in a gas chamber formed by a pair of dielectric material bodies having opposed charge storage surfaces, the improvement wherein each dielectric surface is coated with at least one electron emissive substance having a thickness of at least about 100 angstrom units to provide substantially decreased operating voltages without substantially affecting the memory margin of said device, said electron emissive substance being selected from Group IA elements, Group IA oxides, barium, GaAs, GaP, InAs, InSb, InP, NiO, CsF, CsI, AgOCs, and AuOCs.

B 466,444

TOGGLE SWITCH/INDICATOR CIRCUIT

Thomas F. Bovitz, Hibbing, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,444

Int. Cl.[2] H03K *17/56*

U.S. Cl. 307—137 4 Claims

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UNITED STATES PATENTS

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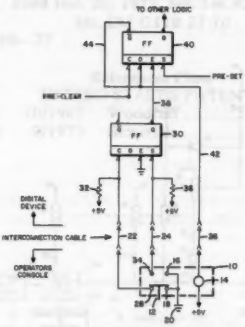


1. Switching apparatus comprising in combination:

a. a double-pole double-throw push-button switch having a pair of normally closed and normally open contacts;

b. an indicator lamp located in close proximity to said push-button switch;

c. first and second transition edge-triggered flip-flops of the type having a Clear input terminal, a Set input terminal, a Data input terminal and an Enable input terminal and first and second complementary output terminals;

d. means connecting one of said pair of normally closed and normally open contacts individually to said Clear input terminal and said Set input terminal of said first flip-flop respectively and the other of said pair of normally closed and normally open contacts to a common point of fixed potential;

e. means connecting said first output terminal of said first flip-flop to said Enable input terminal of said second flip-flop;

f. means connecting said indicator lamp in series circuit between a source of positive potential and said Data input terminal of said second flip-flop; and

g. means connecting said second output terminal of said second flip-flop back to the Data input terminal of said second flip-flop, the arrangement being such that the first momentary closure of said normally open contacts sets

said first flip-flop and enables the toggling of said second flip-flop from its present binary state to its opposite binary state, said indicator lamp being illuminated only when said second flip-flop is in a predetermined one of its two possible states.

B 470,798

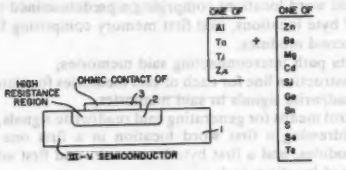
III-V SEMICONDUCTOR DEVICE WITH OHMIC CONTACT TO HIGH RESISTIVITY REGION

Daniel Diguet, Caen, and Jean-Pierre Rioult, Epron, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1974, Ser. No. 470,798
Claims priority, application France, May 18, 1973, 73.18120
Int. Cl.² H01L 23/48, 23/40
U.S. Cl. 357—65 6 Claims

References Cited
UNITED STATES PATENTS

3,716,407	2/1973	Kahn	357/67
3,753,804	8/1973	Tijburg et al.	357/67
3,767,482	10/1973	Kock et al.	357/67
3,780,427	12/1973	Jenkins et al.	357/67
3,794,883	2/1974	Bylander et al.	357/67
3,818,377	6/1974	Yamashita et al.	357/67



1. A semiconductor device comprising a body of a semiconductor material which consists mainly of at least one element of the column IIIA of the periodic table of elements of which the atomic number is lower than 50 and at least one element of the column VA of the said table of which the atomic number is lower than 52, the said body comprising at least one region of a given conductivity type of which the net number of impurities causing the said given conductivity type is lower than 10^{17} atoms per ccm, and at least one ohmic contact to the surface of said one region, said ohmic contact comprising a layer consisting essentially of at least two elements of which the first element is a base metal selected from a first group which consists of: aluminum, tantalum, titanium, and zirconium, and the second element is selected from a second group which consists of zinc, beryllium, magnesium, cadmium, silicon, germanium, tin, sulphur, selenium and tellurium and which causes in the semiconductor region the said given conductivity type, said second element being also incorporated in the region adjacent the surface.

B 475,681

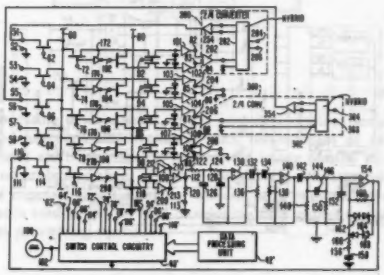
CONFERENCE CALL CIRCUITRY FOR TDM SIGNAL EXCHANGE

Michael Allen Patten, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 3, 1974, Ser. No. 475,681
Int. Cl.² H04M 3/56
U.S. Cl. 179—1 CN 13 Claims

References Cited
UNITED STATES PATENTS

3,551,600	12/1970	Berch	179/18 BC
3,692,947	9/1972	Lewis	179/18 BC
3,699,264	10/1972	Pitroda et al.	179/18 BC
3,835,259	9/1974	Medill et al.	179/18 BC
3,870,819	3/1975	Dennis et al.	179/1 CN



1. Conference call circuitry for conferencing more than two subscribers sets connected in a time division electric signal exchange switching circuit arrangement of the type having

a multiple of pairs of exchange input terminals at which the output signals of subscriber sets are applied,

one pair of said pairs of input terminals being reserved for said conference call circuitry,

a multiple of pairs of exchange output terminals at which the output signals for said subscriber sets appear in reconstructed form,

one pair of said pairs of output terminals being reserved for said conference call circuitry, and

circuitry connected in said switching circuit arrangement for successively sampling the signals appearing at all of said pairs of input terminals and multiplexing the sampling to all of said pairs of output terminals at a predetermined rate at which at least all of the applied signals are translated individually to said pairs of output signal terminals,

the improvement comprising said conference call circuitry including

other input terminals connected to said one reserved pair of exchange output terminals of said switching circuit arrangement,

other output terminals connected to said one reserved pair of exchange input terminals, and

signal reconstructing circuitry comprising active and reactive signal modifying components connected between said other input terminals and said other output terminals for compensating for signal regeneration due to conferencing.

B 476,577

PHASE VOCODER SPEECH SYNTHESIS SYSTEM

James Loton Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 5, 1974, Ser. No. 476,577

Int. Cl.² G10L 1/00

U.S. Cl. 179—1 SM **15 Claims**

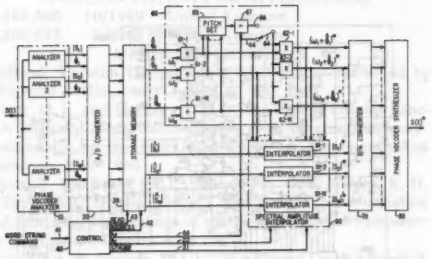
References Cited

UNITED STATES PATENTS

3,360,610	12/1967	Flanagan	179/1 SA
3,369,077	12/1967	French	179/1 SA
3,450,838	6/1969	Bandat	179/1 SA
3,828,132	8/1974	Flanagan et al.	179/1 SA

OTHER PUBLICATIONS

Flanagan, J. and Golden, R., "Phase Vocoder," Bell Syst. Tech. J., Nov. 1966.



1. Apparatus for synthesizing a natural sounding speech message from phase vocoder stored signals representative of a vocabulary of words comprising:

means for selectively extracting preselected locations of said stored signals for constructing a predetermined sequence of signals representative of said speech message;

means for altering the pitch parameters of said extracted signals; and

means for combining said pitch modified signals.

B 482,907

MEMORY SYSTEM WITH BYTEWISE DATA TRANSFER CONTROL

Philippe René Gabriel Nyssens, Brussels, Belgium, and Johannes Bernardus Horsten, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 25, 1974, Ser. No. 482,907

Claims priority, application Belgium, June 26, 1973, 132708

Int. Cl.² G06F 3/00

U.S. Cl. 340—172.5 **11 Claims**

References Cited

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3,638,194	1/1972	Matsushita et al.	340/172.5
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3,705,388	12/1972	Nishimoto	340/172.5
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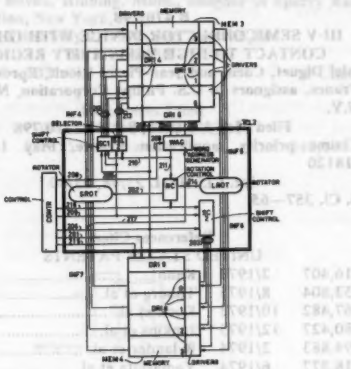


6. A memory system comprising

a first and second memory having memory elements arranged as separately addressable word locations, each of said word locations comprising a predetermined member of byte locations, said first memory comprising first and second modules;

a data path interconnecting said memories;

an instruction line for each of said memories for transferring read/write signals to said memories;

control means for generating said read/write signals, and for addressing a first word location in a first one of said modules, and a first byte location in said first addressed word location; and

means for bytewise-in-parallel selecting information bytes for parallel transfer from said first module.

B 488,634

POWER DISTRIBUTION CONTROL SYSTEM

Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 15, 1974, Ser. No. 488,634

Int. Cl.² H02H 3/00

U.S. Cl. 317—9 R **18 Claims**

References Cited

UNITED STATES PATENTS

3,764,851	10/1973	Hicks et al.	317/11 C

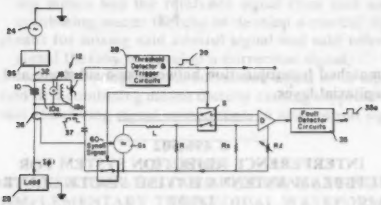
12. The method of controlling ac electric power transmission to provide fault protection comprising the following steps:

establishing a threshold for early detection of potential faults along a power transmission path;

sensing the line signal in the transmission path and producing a threshold signal when it is beyond the established threshold;

producing a reference wave in synchronism with the transmission path;

reducing the impedance on the reference wave upon threshold signalling to produce a simulated fault wave signal



representing the minimum fault value at which the path is to be interrupted;

comparing the line signal and the simulated fault wave in a monitoring time period less than a time period for substantial build-up of power resulting from a fault condition to provide a fault signal for line signal beyond the simulated fault wave signal; and

interrupting power transmission in response to the fault signal while maintaining the transmission path closed in the absence of a fault signal.

B 489,328

SYSTEM FOR CONTROLLING REPLENISHMENT OF DEVELOPER SOLUTION IN A PHOTOGRAPHIC PROCESSING DEVICE

Nobuhiro Takita, Kyoto, Japan, assignor to LogEtronics Inc., Springfield, Va.

Filed July 17, 1974, Ser. No. 489,328

Claims priority, application Japan, Nov. 28, 1973, 48-134220

Int. Cl.² G03D *13/00*

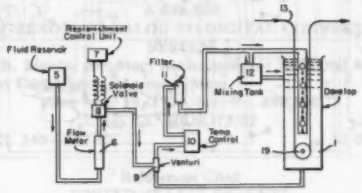
U.S. Cl. 354—298 **15 Claims**

References Cited

UNITED STATES PATENTS

3,529,529	9/1970	Schumacher	354/297 X
3,559,555	2/1971	Street	354/298
3,712,203	1/1973	Kishi et al.	354/324 X
3,787,689	1/1974	Fidelman	354/298 X

9. In a film processor of the type comprising developing, fixing, and washing tanks, means for transporting exposed film along a predetermined path from the input of said processor through said tanks in succession to the output of said processor, a supply of replenishment fluid, and control means operative to selectively feed fluid from said supply to replenish the developer in said developing tank thereby to compensate for the lowered activity of said developer resulting from the processing of said film, the improvement comprising a predevelopment sensor disposed adjacent said transport path upstream of said developing tank and responsive to at least the presence of a sheet of film at the processor input for activating said control means to feed an initial increment of replenishment fluid from said supply to said developing tank prior to



the processing of said sheet, and a post-development sensor disposed adjacent said transport path downstream of said fixing tank and responsive to at least the image density in at least one processed sheet of film for selectively activating said control means to feed a further increment of replenishment fluid from said supply to said developing tank subsequent to the film processing operation.

B 492,688

SEMICONDUCTOR SWITCHING CIRCUIT

Herbert F. Nichols, San Jose, Calif., assignor to Joel Bauman, San Francisco, Calif.

Division of Ser. No. 295,448, Oct. 6, 1972, Pat. No. 3,851,528. This application July 29, 1974, Ser. No. 492,688

Int. Cl.² H03K *17/60*; G05F *3/00*

U.S. Cl. 307—255 **2 Claims**

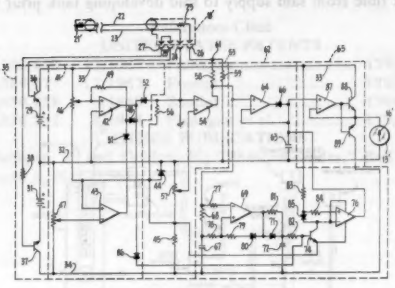
References Cited

UNITED STATES PATENTS

3,225,218	12/1965	Cochran	307/313
3,600,603	8/1971	Watanabe	307/255
3,646,428	2/1972	Torok	323/23
3,649,851	3/1972	Cohen	307/255

1. A semiconductor switching circuit for simultaneously connecting the separate terminals of two dc potentials respectively of positive and negative polarity to a load with a single pole of a switch comprising a load; a terminal providing negative potential; a terminal providing positive potential; a pair of transistors, one of which is a PNP transistor having its emitter connected to said terminal providing positive potential and its collector connected to said load, and the other of which is a NPN transistor having its emitter connected to said terminal providing negative potential and its collector connected to said load; a resistance; and a single pole of a switch, the bases of said transistors being connected to one another through said resistance and said single pole of a switch whereby the

closing of said switch results in simultaneous current flow through said bases to turn said transistors on simultaneously



for the simultaneous application of both of said potentionals to said load.

B 496,487

EPITAXIAL INDIUM-GALLIUM-ARSENIDE PHOSPHIDE LAYER ON LATTICE-MATCHED INDIUM-PHOSPHIDE SUBSTRATE AND DEVICES

George A. Antypas, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 291,457, Sept. 22, 1972, abandoned.
This application Aug. 12, 1974, Ser. No. 496,487
Int. Cl.² H01L *29/205*, *31/00*; H01S *31/19*
U.S. Cl. 357—16 **9 Claims**

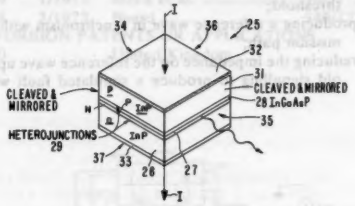
References Cited
UNITED STATES PATENTS

3,218,205	11/1965	Ruehrwein	148/175
3,309,553	3/1967	Kroemer	357/16
3,415,989	12/1968	Leventhal et al.	357/30
3,614,549	10/1971	Lorenz et al.	357/16
3,644,770	2/1972	Bell	313/94
3,672,992	6/1972	Schaefer	357/30
3,691,476	10/1972	Hayashi	357/18
3,801,509	4/1974	Kurata et al.	357/61
3,814,996	6/1974	Enstrom et al.	357/16
3,821,777	6/1974	James	357/30

OTHER PUBLICATIONS

Burnham et al., "$Al_zGa_{1-z}As_{1-y}$, Py'–$GaAs_{1-y}$Py Heterostructure Laser . . . ", Appl. Phys. Lett. 17, pp. 455–457 (11–70).
Shih et al., IBM Tech. Discl. Bull., Vol. 11, No. 12, May 1969, p. 1634.

1. A lattice-matched heterojunction device comprising:
a substrate comprising a binary III-V compound of the elements indium and phosphorus and having a lattice constant falling within the range of 5.45 to 6.05 angstrons;
an epitaxial quaternary III-V layer of the compound InGaAsP joined to the surface of said substrate to form a heterojunction with said substrate, said epitaxial layer having a lattice constant matched to within 0.5 percent of the lattice constant of said substrate to form a lattice



matched heterojunction between said substrate and said epitaxial layer.

B 496,502

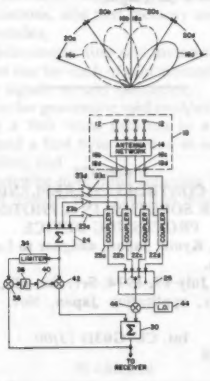
INTERFERENCE REJECTION SYSTEM FOR MULTI-BEAM ANTENNA HAVING SINGLE CONTROL LOOP

Raymond J. Masak, East Northport, and James J. Maune, Plainview, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,502
Int. Cl.² H04B *7/00*
U.S. Cl. 343—100 LE **5 Claims**

References Cited
UNITED STATES PATENTS

3,177,489	4/1965	Saltzberg	343/100 LE
3,763,490	10/1973	Hadley et al.	343/100 SA



1. A system for receiving desired wave energy signals from a selected angular region of space within the area covered by the system and for suppressing interfering signals from all other angular regions within the coverage area comprising:
antenna means, having a first plurality of antenna elements and a second plurality of output ports, for receiving wave energy signals from said coverage area and for developing at each of said output ports a signal primarily representative of the wave energy signals received from a corresponding predetermined angular region of said coverage area;

first means for combining supplied signals in accordance with a predetermined function to develop an output signal;

second means for combining supplied signals in accordance with a predetermined function to develop a reference signal;

means for coupling signals, including desired and interfering signal components, from a selected output port of said antenna means to an input of said first combining means and for coupling a portion of the signals from at least the remainder of said antenna ports to inputs of said second combining means;

means for developing a correction signal comprising:

means for mixing the output signal from said first combining means and the reference signal from said second combining means thereby to develop a control signal;

means for mixing said control signal and said reference signal thereby to develop a correction signal;

and means for coupling said correction signal to an input of said first combining means thereby causing suppression of said interfering signal components in said output signal.

B 497,960

TRANSISTOR AMPLIFIER FOR GENERATING COMPLEMENTARY TRAPEZOIDAL WAVEFORMS

Robert Arthur Hilbourne, Chandlersford, and Peter James, Purley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 497,960

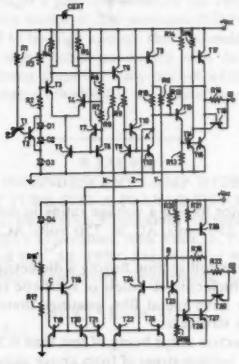
Int. Cl.² H03K *1/00, 3/26, 5/12*

U.S. Cl. 307—270 **9 Claims**

References Cited

UNITED STATES PATENTS

3,252,045	5/1966	Griffin	307/228
3,548,219	12/1970	Lawrie, Jr. et al.	307/268
3,668,436	6/1972	Bacon	328/57
3,868,519	2/1975	Green	307/270



1. A transmission line amplifier for producing at first and second output terminals complementary trapezoidal output waveforms comprising, an input terminal, a single capacitor, circuit means having an input coupled to the input terminal and first and second terminals connected to respective electrodes of said capacitor, said circuit means including means responsive to a change from a first input condition to a second input condition to discharge the capacitor from a first direction of charge and to charge it in the opposite direction to produce a first output condition and responsive to a change from the second input condition to the first input condition to discharge the capacitor and to recharge it in the first direction to produce a second output condition, and means coupled to said first and second terminals for selecting the central portion of the discharge and charge characteristic of said capacitor to produce the positive-going and negative-going transitions of the trapezoidal output waveforms and comprising current balancing means to insure that the output waveform transitions are at their midpoint when the capacitor is half way through its discharge-charge cycle thereby to produce at the first and second output terminals two complementary trapezoidal output waveforms the sum of which is constant.

B 498,500

SELF-ZEROING ANALOG-TO-DIGITAL CONVERSION SYSTEM

Jesse B. Lipcon, Brighton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 19, 1974, Ser. No. 498,500

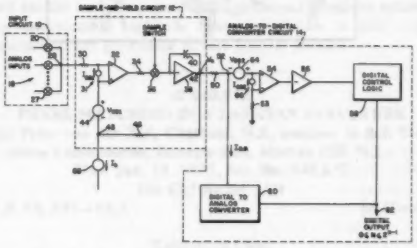
Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 CC **30 Claims**

References Cited

UNITED STATES PATENTS

3,516,002	6/1970	Hillis	340/347 SH
3,653,037	3/1972	Utley	340/347 AD
3,706,986	12/1972	Petit	340/347 AD
3,736,586	5/1973	Donjon	340/347 SH



13. An analog-to-digital conversion system for converting analog inputs into coded digital numbers, said system comprising:

A. means for selecting one of a plurality of said analog inputs;

B. a sample and hold circuit for storing an input analog voltage;

C. a conversion circuit for quantifying said analog voltage into a digital number;

D. comparing means shared by said sample and hold circuit and said conversion circuit for comparing voltages; and

E. switching means for switching said system, said switching means when in a first position enabling said comparing means to compare a voltage from said analog input to a voltage from said sample and hold circuit, said switching means when in a second position enabling said comparing means to compare a voltage from said conversion circuit to a voltage established by said comparing means when said switching means was in said first position; wherein the offset errors in said analog-to-digital conversion system are cancelled such that said system is substantially self-zeroing.

B 506,286

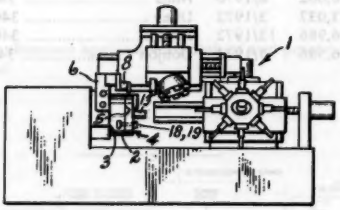
STOCK SENSING DEVICE

Joseph Henry Cox, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sept. 16, 1974, Ser. No. 506,286
Int. Cl.² H01H 3/16
U.S. Cl. 200—61.41 5 Claims

References Cited
UNITED STATES PATENTS

3,187,128	6/1965	Hammer	200/80 R X
3,424,883	1/1969	Heskett	200/81.9 R
3,761,654	9/1973	Davis	200/61.58 R



1. In a machine tool, having a rotating chuck with work gripping members for holding a workpiece being machined, an apparatus for sensing sufficient chucking stock comprising:

a. a body, mounted to said rotating chuck, having its central axis coincident with the axis of rotation of said chuck;

b. an axial bore through the central axis of said body, through which predetermined increments of stock are fed for successive machining operations;

c. an indicator pin, slidably adapted in a radial bore in said body, and located within the dimensional range of the axial length of said work gripping members;

d. mechanical means urging said indicator pin inwardly towards the central axis of said body such that said pin bears on the outer diameter surface of various work sizes when present in said axial bore, and said pin moves inward radially to said central axis of said body when no stock is present at the inwardly-directed end of said indicator pin, and further wherein said mechanical means can trip a stationary signal means when no stock is present beneath said inwardly-directed end of said indicator pin and while said chuck is rotating; and

e. signal means mounted on said machine tool in a stationary position relative to said rotating chuck, wherein said signal means has a signal operator capable of engaging said mechanical means at a predetermined signal position while said body is rotating and said signal means is stationary.

B 506,461

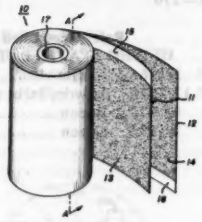
PARTIALLY IMPREGNATED CAPACITOR

Robert J. Flanagan, Hudson Falls; Richard G. Conners, and Richard G. Merrill, both of Glen Falls, all of N.Y., assignors to General Electric Co., Hudson Falls, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,461
Int. Cl.² H01G 4/22
U.S. Cl. 317—259 8 Claims

References Cited
UNITED STATES PATENTS

2,492,210	12/1949	Clark	317/258
3,153,180	10/1964	Bellmore	317/360
2,597,429	5/1952	Bailey	317/258
2,764,718	9/1956	Peck	317/258
2,797,373	6/1957	Peck	317/258
3,251,115	5/1966	Pfeiffer	317/260 X
3,391,313	7/1968	Hevey	317/260 X
3,457,478	7/1969	Lehrer	317/260
3,754,173	8/1973	Eustance	317/259
3,818,288	6/1974	Wenzel	317/260 X



1. A capacitor having a voltage rating in the range of from above about 350 volts AC to 750 volts AC comprising in combination

a. a capacitor roll section having a dielectric and electrode system which consists solely of synthetic resin strips some of which have metal film coatings thereon as the sole electrode structure,

b. said dielectric strips being of less than 0.5 mils thickness to bear a voltage stress of from above about 1200 to 1750 volts per mil at the rated voltage of the capacitor,

c. said strips being wound under heavy tension on a hard cylindrical core to provide a hard round capacitor roll section highly resistant to dielectric liquid penetration at the roll edges,

d. a sealed casing containing said roll section,

e. and a non halogenated dielectric liquid filling said can and submerging said roll edges, and

f. said roll section having a substantially dry central section which predominates the distance between the roll edges which is not penetrated by the dielectric liquid, and narrow margin sections at said edges which are wet by the dielectric liquid.

B 515,908

LIGHT-MEASURING APPARATUS WITH LAMP INDICATOR FOR DETERMINING BALANCE OF A MEASURING BRIDGE

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate, Bozen, Italy

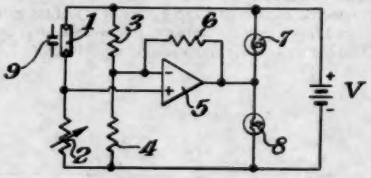
Filed Oct. 18, 1974, Ser. No. 515,908
Claims priority, application Italy, Oct. 26, 1973, 4882/73
Int. Cl.² G01J 1/44; H01J 39/12
U.S. Cl. 250—210 5 Claims

References Cited
UNITED STATES PATENTS

3,530,378	9/1970	Holle et al.	250/210 X
3,794,430	2/1974	Maida	356/226

OTHER PUBLICATIONS

Electronic Indicator, article in Electronic Engineering, Vol. 46, No. 554, Apr., 1974, p. 11.



1. A light-measuring apparatus comprising a measuring bridge, a photoelectric element is arranged in a leg of the measuring bridge, the voltage obtained from the measuring bridge controlling the brightness of two signal lamps arranged in series parallel to a power source feeding the measuring bridge, characterized in that the outputs of the measuring bridge are connected with the inputs of a sum-and-difference amplifier, the output of the sum-and-difference amplifier being connected to a junction between the two signal lamps, the amplification factor of the sum-and-difference amplifier being arranged to be high enough that a simultaneous illumination of both signal lamps connected with the output of the sum-and-difference amplifier only occurs within a predetermined error range allowable for the balancing of the measuring bridge.

B 531,929

ELECTRIC INCANDESCENT LAMP WITH SUPPORT STRUCTURE FOR A PLANAR FILAMENT

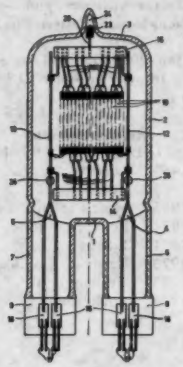
Dirk Jules Remi De Fraeye, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,929
Claims priority, application Netherlands, Jan. 21, 1974, 7400763
Int. Cl.² H01K 1/24
U.S. Cl. 313—273 2 Claims

References Cited
UNITED STATES PATENTS

480,954	8/1892	Melick	313/316
2,006,820	7/1935	Adams et al.	313/274
2,791,713	5/1957	Dean	313/277
3,497,753	2/1970	Huston, Jr.	313/222
3,555,338	1/1971	Scoledge et al.	313/315
3,626,236	12/1971	Robinson et al.	313/222
3,777,207	12/1974	Noteteirs et al.	313/222

1. An electric lamp which comprises a glass lamp envelope having a dish-shaped bottom portion and a cavity at the opposite end thereof, said cavity being the interior of a fuse tip of a sealed exhaust tube, two generally planar filaments disposed in generally parallel relationship in said envelope, a frame carrying each filament comprising two side beams and two cross beams disposed in generally parallelogram relationship, first and second supply member extending through and sealed in said bottom portion, said first member being connected to one of said side beams and said second member being connected to the other of said side beams, means for holding said



frames relative to the upper wall of the lamp envelope, said means for holding comprising a brace which includes two pieces of wire, one end of each wire being secured to one of said cross beams proximate to said upper wall, the other end of each wire being coupled together and engaging said cavity, and further including quartz bridge-shaped members extending intermediate said side beams proximate to said cross beams that are proximate to said bottom portion.

B 540,872

PHASE MATCHING IN A LAMINAR STRUCTURE

Jan Peter van der Ziel, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

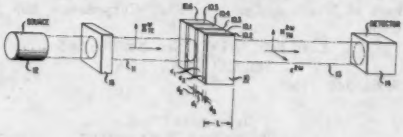
Filed Jan. 14, 1975, Ser. No. 540,872
Int. Cl.² H02M 5/04
U.S. Cl. 307—88.3 16 Claims

References Cited
UNITED STATES PATENTS

3,537,020	10/1970	Anderson	330/4.5

OTHER PUBLICATIONS

"Applied Physics Letters," 17, pp. 483–485, (1970), Bloembergen et al.
"Applied Physics Letters," 19, pp. 266–268, (1971), Anderson et al.
"Journal of Applied Physics," 44, pp. 3180–3181, (1973), Yacoby et al.



1. A nonlinear optical device comprising a multilayered body including a plurality of pairs of layers of material having sufficiently different refractive indices to substantially cancel dispersion produced when a plane wave optical beam at a fundamental frequency propagates through said layers and parallel thereto, at least one of said layers of each pair comprising a nonlinear material and the thickness of said layers

relative to one another being effective to phase match said beam to the second harmonic thereof and being smaller than the wavelength corresponding to said fundamental frequency.

B 545,050

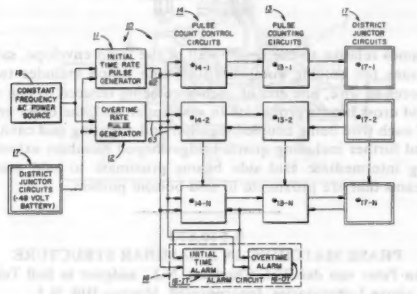
SYSTEM FOR MEASURING THE DURATION OF A TELEPHONE CALL

Gary L. Baltzer; Duane A. Desler, and George Pappas, all of Omaha, Nebr., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,050
Int. Cl.² H04M *15/18*
U.S. Cl. 179—7.1 R **13 Claims**

References Cited
UNITED STATES PATENTS

2,910,537	10/1959	Lomax	179/6.31
3,097,266	7/1963	Luscher	179/7 R
3,164,677	1/1965	Morris et al.	179/7.1 R
3,573,378	4/1971	Leyburn et al.	179/7.1 R
3,590,161	6/1971	Jacobs	179/7.1 R
3,760,101	9/1973	Burns	179/6.3
3,769,463	10/1973	Graham et al.	179/7.1 TP
3,801,745	4/1974	Zuckerman	179/7.1 R



1. A system for measuring the duration of a telephone call, which comprises:

first and second pulse generating means for generating pulses at selected frequencies representative of a call initial time rate and a call overtime rate, respectively, and

pulse counting means for counting the pulses from said first pulse generating means until a maximum initial time period for the call initial time rate is reached, and for then counting the pulses from said second pulse generating means to measure the call overtime period.

B 546,665

RESOLVER TO DIGITAL CONVERTER

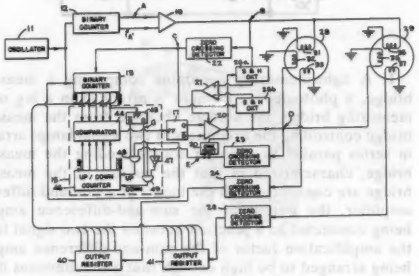
George W. Miller, Anoka, and Larry A. Meyer, Minneapolis, both of Minn., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 3, 1975, Ser. No. 546,665
Int. Cl.² G08C *19/48*
U.S. Cl. 340—198 **7 Claims**

References Cited
UNITED STATES PATENTS

2,980,900	4/1961	Rabin	340/198
3,258,667	6/1966	McDonough et al.	340/206
3,562,740	2/1971	Watkins	318/661
3,634,838	1/1972	Granqvist	340/198
3,803,567	4/1974	Pezzlo et al.	340/198

7. A resolver to digital converter comprising a high frequency signal source; a frequency divider connected to said source, said divider providing a low-frequency signal; first and second filtering means for converting a low-frequency signal to a sinusoidal signal, each of said filtering means having an input and an output, said input of said first filtering means being connected to the output of said divider; a resolver having first and second stator windings and a rotor winding; said first stator winding being connected to said output of said first filtering means; first, second and third zero crossing detectors each having an input and an output, said input of said first detector being connected to said output of said first filtering means; a binary counter having a signal input, a reset input and a plurality of output leads, said signal input lead of said binary counter being connected to said high frequency signal source, said reset input lead being connected to said output of said first detector, said first detector providing a pulse to reset said binary counter at the end of each cycle of said sinusoidal signal; an up/down counter having first and second input leads for adding and subtracting to the count in said up/down counter and a plurality of output leads; first and second logic gates each having first, second and third input leads and an output lead, said output of said second zero crossing detector being connected to said first input lead of said first gate, a flip-flop, said flip-flop being connected between a first output lead of said binary counter and a second input lead of each of



said first and said second gates, said output lead of said first gate being connected to said first input lead of said up/down counter; an inverter, said inverter being connected between said output of said second zero crossing detector and said first input lead of said second gate, said high frequency source being connected to said third input lead of each of said first and said second gates, said output lead of said second gate being connected to said second input lead of said up/down counter; a comparator having an output lead, said output leads of said binary counter and of said up/down counter being connected to said comparator, said comparator providing a pulse to said output lead each time the count of said binary counter matches the count of said up/down counter, said output lead of said comparator being coupled to said input of said second filtering means, said output of said second filtering means being connected to said second stator winding and to said input lead of said second zero crossing detector; and an output register having a plurality of signal input leads and a trigger input lead, said signal input leads of said register each being connected to a corresponding one of said output leads of said binary counter, said trigger input lead of said register being connected to said output of said third detector, said input of said third detector being connected to said rotor winding of said resolver.

B 547,994

DOPPLER RADAR DEVICE

Serge Guennou, Croissy-sur-Seine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,994
Claims priority, application France, Feb. 11, 1974, 74.4466
Int. Cl.² H01Q 13/02
U.S. Cl. 343—786 4 Claims

References Cited
UNITED STATES PATENTS

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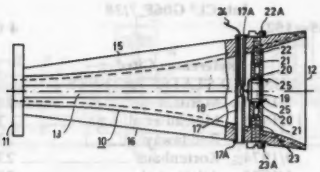
3,852,743	12/1974	Gupta	343/8



1. A Doppler radar device which transmits a linearly polarized electromagnetic wave which is radiated by means of an aerial which is formed by a flared horn having a rectangular cross-section, the smaller sides thereof being parallel to the direction of the electrical field of the radiated wave, and which detects the Doppler-frequency signal resulting from the reception of the wave reflected by a moving object by means of a semiconductor diode which is arranged in the said horn, characterized in that a conductive body is arranged inside the horn and parallel to the direction of the electrical field of the transmitted wave, the width of the said body being small with respect to the width of the horn and the body occupying the entire "height" of the horn at the area where the body is arranged, the said body being situated in the horn at a distance from the horn opening which is larger than the distance between the semiconductor diode and the said opening, the said semiconductor diode being arranged parallel to the direction of the electromagnetic field and in a region where thte intensity of the electrical field of the radiated wave is attenuated by the presence of the said conductive body.

B 549,931

GAS DISCHARGE LASER

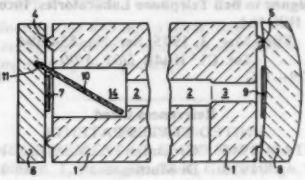
Kornelis Bulthuis; Johannes Van der Wal, and Bram Johan Derksema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1975, Ser. No. 549,931
Claims priority, application Netherlands, Feb. 28, 1974, 7402691
Int. Cl.² H01S 3/02
U.S. Cl. 331—94.5 C 4 Claims

References Cited
UNITED STATES PATENTS

3,656,067	4/1972	Zavodny	331/94.5 C

1. A gas discharge laser for generating stimulated emission, which comprises: a laser tube, first and second reflectors disposed at the ends of said laser tube, at least one of the said reflectors including means for passing a coherent beam, and a plane parallel transparent plate disposed with a normal thereto enclosing an angle with the axis of said laser tube



equal to the Brewster angle, said plate being carried by the other of said reflectors.

B 550,693

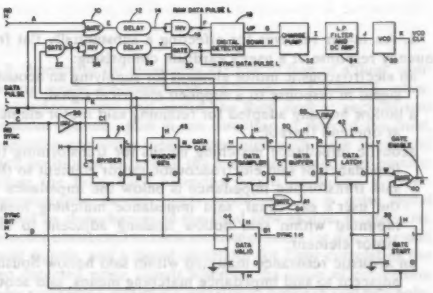
PHASE LOCK LOOP WITH DELAY CIRCUITS FOR RELATIVE DIGITAL DECODING OVER A RANGE OF FREQUENCIES

Chao S. Chi, Shresbury; Peter T. McLean, Stow, and Norman A. Field, Acton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 18, 1975, Ser. No. 550,693
Int. Cl.² H03B 3/04; H03K 5/18
U.S. Cl. 328—155 10 Claims

References Cited
UNITED STATES PATENTS

3,599,110	8/1971	Gindi	331/1 A
3,614,635	10/1971	LaPine et al.	328/155
3,840,821	10/1974	Conway	331/25 X



1. In an apparatus for synchronizing clock signals and data pulses, the combination comprising:

A. a variable frequency oscillator for providing a continuous series of said clock signals;

B. first delay means responsive to said data pulses for providing a first predetermined delay;

C. second delay means responsive to said clock signals for providing a second and third predetermined delay;

D. means responsive to said second delay means for reconditioning said data pulses to said clock signals;

E. means for comparing the output of said reconditioning means with said first delay means; and

F. means responsive to said comparing means for varying the frequency of said variable frequency oscillator.

B 554,594

STEREOPHONIC SOUND REPRODUCTION WITH ACOUSTICALLY MATCHED RECEIVER UNITS EFFECTING FLAT FREQUENCY RESPONSE AT A LISTENER'S EARDRUMS

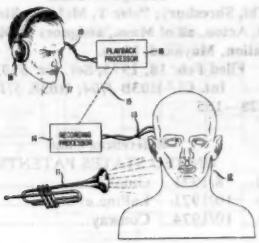
Robert Lee Wallace, Jr., Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 3, 1975, Ser. No. 554,594
Int. Cl.² H04R *1/02, 5/00*
U.S. Cl. 179—1 G **14 Claims**

References Cited
UNITED STATES PATENTS

2,363,175	11/1944	Grossman	179/107 R
2,849,533	8/1958	Di Mattia	179/107 E
3,157,750	11/1964	Weingartner	179/115.5 R
3,558,833	1/1971	McCrory	179/175.1 A
3,798,393	3/1974	Gorike	179/182
3,890,474	6/1975	Glicksberg	179/107 E

OTHER PUBLICATIONS
"An Ear-Like Coupler—," by Zwislocki, Apr., 1971, Special Report LSC-S-9.



1. An in-ear receiver for effecting a substantially flat frequency response at a user's eardrum comprising:
- an electroacoustic motor element for supplying an acoustic signal in response to a supplied electrical signal;
- a hollow housing adapted for retaining said motor element at one end thereof;
- acoustic impedance matching means for transforming the impedance of said electroacoustic motor element so that said transformed impedance is below the impedance of the user's ear canal, said impedance matching means mounted within said hollow housing adjacent to said motor element;
- an acoustic resistance mounted within said hollow housing adjacent to said impedance matching means, said acoustic resistance substantially identical to said characteristic impedance of said user's ear canal; and
- end plate means mounted across the end of said hollow housing adjacent to said acoustic resistance, said end plate means adapted for insertion in the outer opening of said user's ear canal, said end plate including an orifice for acoustically coupling the signals produced by said electroacoustic motor element to said ear canal.

13. In a stereophonic recording system including a recording mannequin equipped with recording microphones and means for processing the signal produced by said microphones for playback to a remote listener, the improvement comprising acoustic impedance means mounted within said recording mannequin for establishing the acoustic signal which impinges upon said microphones substantially identical to that acoustic signal which would reach the eardrums of a human listener occupying the same location as said recording mannequin.

B 559,737

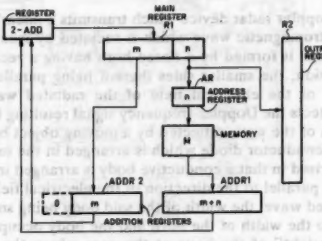
METHOD FOR GENERATING PSEUDO-RANDOM BIT SEQUENCE WORDS AND A DEVICE FOR CARRYING OUT THE METHOD

Lars Henning Zetterberg, and Leif Ake Arvidsson, both of Jarfalla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,737
Claims priority, application Sweden, Mar. 20, 1974, 7403748
Int. Cl.² G06F *7/38*
U.S. Cl. 235—152 **4 Claims**

References Cited
UNITED STATES PATENTS

3,746,847	7/1973	Maritsas	235/152
3,777,278	12/1973	Majeau et al.	331/78
3,811,038	5/1974	Reddaway	235/152
3,838,259	9/1974	Kortenhaus	235/152
3,881,099	4/1975	Ailett et al.	235/152



1. A method for generating pseudo-random bit-sequence words consisting of 0's and 1's by means of registers, and a series of such words each having a predetermined number of bits comprising the steps of
- supplying a starting bit pattern which is not entirely composed of 0's into a main register which comprise a predetermined number $m + n$ of bistable elements, where m and n are integers;
- using the bit-contents of a predetermined number n of said elements of said main register as an address for reading out from a memory a corresponding superposition bit-sequence having a length equal to the length of said main register;
- selecting the bit-sequence of predetermined ones of said elements of said main register, corresponding to a word length of n bits as a first word of said series;
- modifying the bit sequence of the remaining m ones of said elements of said main register by transposing the bits in accordance with a predetermined reproducible transposition pattern; and
- simultaneously feeding back the result of said modifying step into the main register.

REISSUES

JANUARY 20, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

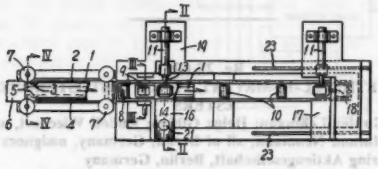
Re. 28,684
APPARATUS FOR AUTOMATICALLY CONNECTING SHUTTER SLAT AND PREVENTING ITS DISENGAGEMENT

Hiroshi Kataoka, Osaka, Japan, assignor to Overhead Door Corporation, Dallas, Tex.

Original No. 3,651,555, dated Mar. 28, 1972, Ser. No. 72,732, Sept. 16, 1970. Application for reissue Feb. 11, 1974, Ser. No. 441,554

Int. Cl. B23p *19/04*

U.S. Cl. 29—208 D 12 Claims



1. Apparatus for automatically connecting shutter slat and preventing its disengagement which comprises: a feed means which moves the shutter slat having a notch and slots for preventing its disengagement and cut in specified dimension, to the connecting position while guiding it exactly; a forward feed means that moves the shutter slat, which is moved to said connecting position, to the holding position and holds it there; and a press means provided ahead of said holding position in order to prevent the connected shutter slat from being disengaged, thereby automatically connecting shutter slats that are sent to the connecting position one after another, and preventing the connected slats from being disengaged.

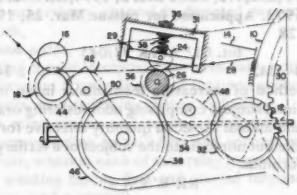
Re. 28,685
METHOD AND APPARATUS FOR THE TREATMENT OF COTTON FIBRES

André Varga, Toronto, Canada, assignor to Carding Specialists (Canada) Limited, Toronto, Canada

Original No. 3,003,195, dated Oct. 10, 1961, Ser. No. 771,050, Oct. 31, 1958. Application for reissue Nov. 14, 1969, Ser. No. 871,494

Int. Cl.² D02G *3/00*; D01G *15/00*

U.S. Cl. 57—156 2 Claims



6. In the production of cotton yarns of improved quality and cleanliness by the cotton system, the method of treating the cotton fibres which comprises, in sequence:

a. carding the fibres and forming them into a thin carded web;

b. passing said web through crushing rollers adapted to crush small impurities in the web;

c. subjecting said web on leaving said crushing rollers to a longitudinal drafting action sufficient to cause relative longitudinal fibre movement therein;

d. condensing said web into a sliver; and

e. processing the fibres of said sliver into yarn by steps comprising drafting and spinning.

Re. 28,686
MEASUREMENT OF FLUID FLOW RATES

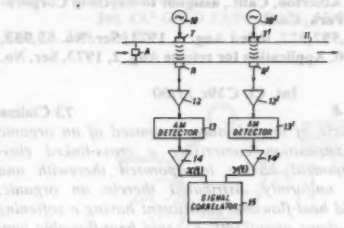
John Coulthard, 1, Sinnington Close, Guisborough, Yorkshire, England

Original No. 3,762,221, dated Oct. 2, 1973, Ser. No. 159,864, July 6, 1971. Application for reissue Sept. 12, 1974, Ser. No. 505,609

Claims priority, application United Kingdom, July 6, 1970, 32563/70; Jan. 19, 1971, 2593/71

Int. Cl.² G01F *1/00*

U.S. Cl. 73—194 E 27 Claims



1. Apparatus for measuring the rate of flow of a fluid, comprising means for transmitting a beam of [radiant] *ultrasonic* energy, into and across the fluid flow at each of two positions spaced apart in the direction of flow of the fluid, respective receiving means associated with each beam and each positioned to receive the associated beam after passage across the flow, each receiving means producing a beam-representative carrier signal modulated by a noise signal caused by disturbances in the fluid flow profile, a respective detector connected to each receiving means for detecting said noise signals, and a signal correlator for cross-correlating the two detected noise signals whereby the value of correlation delay producing maximum correlation between said two noise signals can be ascertained.

Re. 28,687
WIRE STRIPPER

Irving R. Metcalf, St. Charles, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

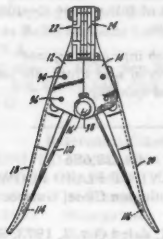
Original No. 3,564,951, dated Feb. 23, 1971, Ser. No. 712,682, Mar. 13, 1968. Application for reissue Jan. 26, 1972, Ser. No. 326,819

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.5 A 24 Claims

1. In a stripper mechanism, a pair of pivoted levers, handles on the levers constructed to perform a closing and opening action effective to open and close the levers, pairs of clamping and stripping members on the levers effective to grasp and strip insulation from wire positioned between them, and a

friction retard mechanism effective to releasably hold the levers apart in pivoted position while the paired members



separate allowing a wire to be removed prior to closing of the levers.

Re. 28,688

SOLID HEAT-FLOWABLE DISPERSED PHASE IN A CROSSLINKED ELASTOMER

Paul M. Cook, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Original No. 3,597,372, dated Aug. 3, 1971, Ser. No. 65,953, Oct. 31, 1960. Application for reissue Aug. 2, 1973, Ser. No. 385,050

Int. Cl. C29c *13/00*

U.S. Cl. 260—4 **73 Claims**

36. *An article of manufacture composed of an organic polymeric composition comprising a cross-linked elastomeric component having incorporated therewith and substantially uniformly distributed therein an organic, normally solid heat-flowabel constituent having a softening temperature above about 140° F., said heat-flowable constituent being present in an amount sufficient to hold said elastomeric component in a stretched, elastically deformed condition, said article being elastomeric at storage temperatures and at the softening temperature of said heat-flowable constituent and being in a dimensionally heat-unstable condition capable of altering its physical form upon application of heat alone to soften said heat-flowable constituent, said article upon application of such heat assuming a dimensionally heat-stable condition, the article in its altered, heat-stable form being elastomeric.*

Re. 28,689

METHOD OF MOLDING A BUILDING STRUCTURE BY SPRAYING A FOAMED PLASTIC ON THE INSIDE OF AN INFLATABLE FORM

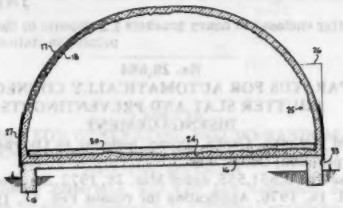
Lloyd S. Turner, 50 Chestnut Ave., Los Gatos, Calif. 95030

Original No. 3,277,219, dated Oct. 4, 1966, Ser. No. 98,457, Mar. 27, 1961. Application for reissue Nov. 24, 1972, Ser. No. 309,123

Int. Cl.² B29D *27/04*

U.S. Cl. 264—46.6 **13 Claims**

1. A method for erecting a building structure comprising: inflating a form, [positioning thickness gauges within the inner surface of the form, said thickness guages being preformed from a plastic foam material,] spraying a [n additional quantity of the same] plastic foam material against the inside of the form to build up a [layer having a thickness determined by the thickness gauges which become integral with the] layer, [and] allowing the plastic foam to harden



and become rigid and self-supporting [.] *and coating the inside of the layer of foam with a layer of concrete.*

Re. 28,690

17α-ETHINYL-18-METHYL-19-NORTESTOSTERONE ESTERS

Hans-Gunter Lehmann; Heinz Glbian; Rudolf Wiechert, and Friedmund Neumann, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Original No. 3,514,514, dated May 26, 1970, Ser. No. 547,438, May 5, 1965. Application for reissue July 19, 1974, Ser. No. 490,022

Claims priority, application Germany, May 5, 1965, 37001

Int. Cl.² A61K *31/56*

U.S. Cl. 424—238 **6 Claims**

1. A therapeutic compound for inhibiting ovulation comprising [as active ingredient a compound selected from the group consisting of] a 17-ester of 17α-ethinyl-18-methyl-19-nortestosterone [and a 17α-ethinyl-18-methyl-$\Delta^{3,5}$-estradiene-3, 17β-diol-3, 17β-diester] wherein the said 17-ester [and 3, 17β-diester groups are] *group is* formed from *an* aliphatic carboxylic [acids] *acid* having from [1] *six* to 11 carbon atoms in the ester residue [; and a pharmaceutical carrier for said compound].

Re. 28,691

METHODS AND COMPOSITIONS FOR INCREASING FEED INTAKE OF ANIMALS USING TERTIARY ALCOHOLS

Clifton A. Baile, Glen Mills; Gregory Gallagher, Collegeville; Carol L. McLaughlen, Malvern, and Robert Lee Webb, West Chester, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Original No. 3,852,473, dated Dec. 3, 1974, Ser. No. 328,235, Jan. 31, 1973. Application for reissue Mar. 25, 1975, Ser. No. 561,728

Int. Cl.² A61K *31/045*

U.S. Cl. 424—343 **14 Claims**

1. The method of increasing feed intake in an immature ruminant animal subject comprising administering orally or by implant to said animal subject a quantity effective for increasing feed intake but nontoxic to the subject of a tertiary alcohol having the formula:

RR′R″CX

in which:

R is lower alkyl of from 1–9 carbons or hydroxy lower alkyl of from 1–9 carbons;

R′ is lower alkyl of from 1–9 carbons, fluoro, bromo or chloro;

R″ is lower alkyl of from 1–9 carbons, lower alkenyl of from 2–9 carbons, *lower alkynyl of from 2–9 carbons* and, when R and R′ are lower alkyl or hydrogen, *R″ is* phenyl; and

X is —OH.

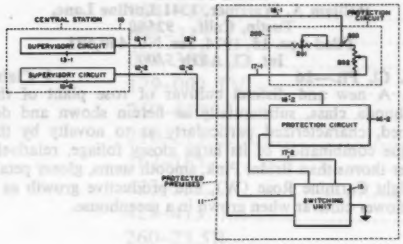
Re. 28,692
MONITORING APPARATUS AND METHOD FOR ELECTRICAL PROTECTION SYSTEMS

Raymond J. Highstone, deceased, late of Scottsdale, Ariz., by American District Telegraph Co., and Manfred W. Muehter, Lanoka Harbor, Jersey City, N.J., assignors to American District Telegraph Company, New York, N.Y.

Original No. 3,401,384, dated Sept. 10, 1968, Ser. No. 516,896, Dec. 28, 1965. Application for reissue Jan. 10, 1975, Ser. No. 540,147

Int. Cl.² G08B *13/22*

U.S. Cl. 340—276 **11 Claims**



1. Apparatus for increasing the security of an electrical protection system in which a protected location is conductively coupled to a central station which comprises at least two conductive means for coupling said protected location to said central station,

at said central station, a first supervisory circuit and a second supervisory circuit, each supervisory circuit including a source of supervisory current coupled to a corresponding one of said conductive means and current-sensitive means coupled to said corresponding conductive means to detect predetermined changes in supervisory current therein, and

at said protected location, a first protection circuit and a second protection circuit respectively corresponding to said first and second supervisory circuits at said central station, wherein each protection circuit is provided with an input terminal, a shunt terminal and an output terminal, and wherein at least one of said protection circuits is provided with at least one detection device connected between said input terminal and said output terminal so that operation of said detection device alters the flow of supervisory current in said protection circuit,

means for connecting the input terminal of each of said protection circuits to a corresponding one of said conductive means to couple each protection circuit to a corresponding supervisory circuit at said central station, so that supervisory current is directed to each protection circuit,

a ground point,

switching means interposed between said ground point and said output terminals of said first and second protection circuits, said switching means including:

first relay means and second relay means respectively corresponding to said first and second protection circuits, wherein each of said relay means is provided with a winding having first and second terminals, an armature, and a contact,

means for connecting the second terminal of each relay means to said ground point,

means for connecting the armature of each relay to the first terminal of the winding of the other relay,

two first conductor means for connecting the output terminals of said first and second protection circuits to said respective first terminals of said windings of said corresponding first and second relay means, and

two second conductor means for connecting the shunt terminals of each of said first and second protection circuits to said contacts of said second and first relay means, respectively, wherein each of said shunt terminals is located in said respective first and second protection circuits at a point selected to shunt a predetermined portion of the respective protection circuit in response to the energizing of the relay means corresponding to the other protection circuit.

Re. 28,693
IMAGE TRANSFER RECORDING APPARATUS WITH RESIN COATED DRUM

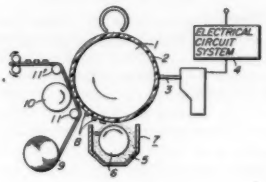
Tetsuo Doi, and Shoji Sagae, both of Hitachi, Japan, assignors to Hiatchi, Ltd., Japan

Original No. 3,662,395, dated May 9, 1972, Ser. No. 9,176, Feb. 6, 1970. Application for reissue May 9, 1974, Ser. No. 468,600

Claims priority, application Japan, Feb. 7, 1969, 44-8738; Nov. 7, 1969, 44-88757

Int. Cl.² G01D *15/06*; G03G *15/16*

U.S. Cl. 346—74 ES **9 Claims**



1. An apparatus for recording an image by transfer printing comprising a recording drum composed of a drum member of conductive metal and a layer of resin covering the surface of said drum member, said layer having a breakdown voltage of not less than 1 KV, a volume resistivity of more than $10^{14}\Omega$ cm, a surface resistivity of more than $10^{14}\Omega$ and no pinholes and preventing fused toner from attaching thereto, means for applying information [in the form of a signal voltage] *of the image* to the surface of said recording drum [through a recording electrode thereby] to form a latent image of an electrical charge on the surface of said recording drum, developing means for selectively supplying a powdery developer [through the medium of a magnet drum] to the latent image [formed] *to form a powder image* on *the surface of* said recording drum, heating means for applying heat to a recording sheet, and means for transfer printing the powder image [that is selectively attached to the latent image portion] on *the surface of* said recording drum onto the heated recording sheet, and at the same time, fusing the powder to firmly fix *the* same to the recording sheet under heat.

PLANT PATENTS

GRANTED JANUARY 20, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,824

ROSE PLANT

Mathias Tantau, Utersen, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sept. 16, 1974, Ser. No. 506,755

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct cultivar of rose of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, compact plant habit, abundant, large foliage, an orange red flower color.

3,825

ROSE PLANT

William A. Warriner, 1341 Lurline Lane, Tustin, Calif. 92680

Filed Apr. 15, 1974, Ser. No. 460,691

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—26 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its large glossy foliage, relatively fewer thorns than Bridal Pink, smooth stems, glossy petals of light Carmine Rose (W), and productive growth as a cut flower cultivar when grown in a greenhouse.

PATENTS

GRANTED JANUARY 20, 1976

ERRATA

For CLASS	See PATENT NO.
084–318	3,933,077
084–387	3,933,078
084–388	3,933,079
179–002 TV	3,933,233
250–439	3,933,251
210–213	3,933,792
162–183	3,933,966
423–232	3,934,012
428–413	3,933,875
260–23.5R	3,934,056

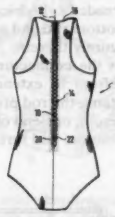
PATENTS

GRANTED JANUARY 20, 1976

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

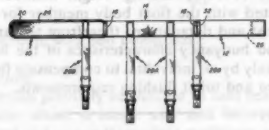
GENERAL AND MECHANICAL

3,932,896
SWIMSUIT
Konrad Dottinger, Reutlingen, Germany, assignor to Busino & Co., Reutlingen, Germany
Filed Feb. 22, 1974, Ser. No. 444,954
Int. Cl.² A41D 7/00
U.S. Cl. 2—67 **5 Claims**



1. A swimsuit comprised of an elastic material adapted to snugly fit the wearer and including a waist portion of reduced diameter between a lower and an upper portion, said upper portion including front and back parts extending upwardly from said waist portion between a pair of arm cutouts and joining each other on each side of the wearer's neck to form a generally circular neck opening which encircles the wearer's neck to substantially prevent water and air from entering the suit through the neck opening with the uppermost point on said neck opening lying at the rear thereof, a narrow elongate-shaped passage below the rear of said neck opening extending centrally from said uppermost point through said back part and downwardly into and below said waist portion, and means extending throughout the length of said elongate passage for maintaining it in said narrow shape whereby air or water entering said suit may exit through said opening.

3,932,897
HOCKEY GARTER BELT
Nathan H. Young, Boynton Beach, Fla., assignor to Baka Manufacturing Co., Inc., Plainville, Mass.
Filed Dec. 12, 1974, Ser. No. 531,922
U.S. Cl. 2—306 **3 Claims**



1. A hockey garter belt comprising:
a body encircling member having first and second elongate end sections and intermediate elongate section, the end sections being connected to opposite ends of the intermediate section;
the first of the end sections being formed from a nonstretchable web of material;
the second of the end sections being formed from a nonstretchable web of material and having one surface thereof substantially completely covered by and defining a looped fabric, the looped fabric extending along at least one third of the overall length of the body encircling member;
the intermediate section being formed from an elastic webbing which is stretchable in its longitudinal direction;
a plurality of elongate garter straps each formed from a length of the body encircling sections having at least one garter strap attached thereto at the inside surface thereof, each garter strap having means at the free end thereof for attaching a portion of a stocking thereto, at least two of the garter straps being attached to the elastic intermediate section;
the inwardly facing surface of the second end member being of a relatively soft fabric; and
a strip of fastener material secured to the free end of the first end section and on the opposite side of the body encircling member from that on which said looped fabric is disposed, the fastener material including a multiplicity of closely spaced hooked mem-ers to releasably lock with the looped fabric at any location along the looped fabric.

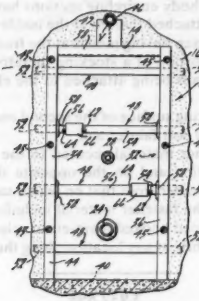
3,932,898
PROSTHETIC HEART VALVE SEPARATELY FORMED CAGE
John Thomas Matthew Wright, Southport, England, assignor to National Research Development Corporation, London, England
Filed Sept. 4, 1974, Ser. No. 503,527
Claims priority, application United Kingdom, Sept. 28, 1973, 45444/73
Int. Cl.² A61F 1/22
U.S. Cl. 3—1.5 **5 Claims**

1. In a prosthetic heart valve comprising a valve body including an annular base member, from circumferentially spaced positions of which a plurality of elongate members extend first generally axially and then mutually inwardly to define a cage, and which further comprises a movable valve member captively located in said cage for movement into and out of valve-closure seating engagement with said base member, the improved valve body construction in which:
said base member is formed with a circumferential groove around its radially outer periphery;
said elongate cage members are interconnected by arcuate members held in said groove;
said elongate cage members and said arcuate members are defined by successive portions of a single elongate member having its free ends fixed to other points therealong to form a closed loop configuration;
and said configuration includes two arcuate member portions of diametrally opposed quadrant shape and location, and four elongate cage member portions extending generally axially from respective ends of said arcuate member portions, said elongate cage member portions being formed mutually inwardly and interconnected at their ends remote from said arcuate member portions.

3,932,899
COMBINATION SUPPORT FRAME AND SECURITY MEANS

G. Vincent Brady, Philadelphia, and J. Les Campbell, Flourtown, both of Pa., assignors to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 244,820, April 17, 1972. This application June 25, 1974, Ser. No. 483,030
Int. Cl.² A47K 4/00
U.S. Cl. 4—3 8 Claims



1. In combination with a plumbing facility adapted to be mounted in confronting relation to an access opening in a structure fabricated of concrete, within which water supply and drain conduits for the facility are located,

a frame cast into said concrete within the opening and comprising a plurality of frame elements arranged in end-to-end abutting relation and located around the periphery of said opening and a plurality of spaced security bars extending across said opening and supported at opposite ends thereof by said frame elements with some of said ends extending beyond said frame elements into said concrete for preventing unauthorized passage from one side of said structure to the opposite side thereof through said opening,

at least one of said security bars including means for expanding said frame to assure contiguous engagement thereof with the periphery of said opening, said security bar comprising first and second end sections having confronting terminal end portions threaded with opposite hand thread forms, and wherein said expansion means comprises a sleevelike member having an internally threaded bore adapted for threadable engagement with said terminal end portions, whereby preselected rotational movement of said sleeve element will effect opposed movement of said bar sections to cause the associated frame to expand into contiguous engagement with the periphery of said opening, and

means attached to said frame and protruding therefrom adapted to support part of said plumbing facility.

3,932,900
TOILET WATER SAVER

Victor Huston, and James R. Huston, both of 2363 S. Dangle, Muskegon, Mich. 49442

Filed Sept. 16, 1974, Ser. No. 506,032
Int. Cl.² E03D 1/34
U.S. Cl. 4—63 2 Claims

1. A water saver device intended for use with a conventional toilet flush tank including a water inlet valve controllable by a support rod having a float connected to one end thereof, the device comprising, in combination:

a connector member adapted to be readily mounted to the support rod in a position adjacent the float, the connector member comprising;

an elongated solid body member having a top end and a bottom end and parallel side surfaces;

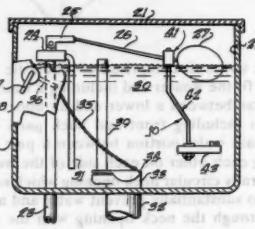
an open faced channel defining slot extending through one of the side surfaces and opening out of each of the adjacentmost side surfaces intermediate the top and bottom ends of the connector;

a threaded bore extending through the top end in communication with a side wall of the slot;

a threaded cylindrically shaped set screw threadedly received in the threaded bore for rotation about its axis between a position spaced from the slot and a position projecting into the slot to engage and retain the connector to the float support rod passing through the slot; and

an interiorly threaded cylindrical bore extending upward through the bottom end and adapted to receive one end of the rod securely therein;

a rod mounted to the connector member and projecting outwardly therefrom to extend vertically into a water level of a toilet tank, the rod provided with screw threads on both ends thereof, one end of the rod being threadedly received in the bottom end threaded bore of the connector, the opposite end of the rod being connected to the float body member;



a float body member affixed to the projecting free end of the rod and extending therefrom, the float body member comprising a box-like rectangularly configured float housing having a flat top surface, a flat bottom surface, vertical side wall surfaces, and vertical front and back end surfaces, a washer member having an aperture in its center secured in a flat manner on the top surface adjacent the float member back end, a nut having a threaded aperture in vertical axial alignment with the aperture of the washer and affixed in a flat manner on the bottom surface of the float member, the free end of the rod extending through the washer aperture and being threadedly received in the nut to secure the float member to the rod; and

a plurality of compensating weight members removably associated with the float body member for selective attachment and detachment therefrom to vary the floatation and buoyancy characteristics of the body member selectively by an individual to compensate for local water pressure and toilet flushing requirements.

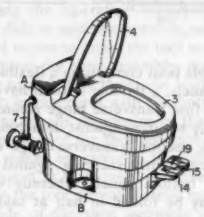
3,932,901
FLUSH TOILET BOWL

Kanji Inui; Jun-Ichi Sakamoto, both of Hirakata, and Yukihiro Gokoh, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 22, 1974, Ser. No. 499,512
Claims priority, application Japan, Aug. 28, 1973, 48-96365
Int. Cl.² E03D 11/10
U.S. Cl. 4—79 4 Claims

1. A flush toilet bowl comprising a bowl unit containing a bowl having a bowl seat and a lid in the upper part and a discharging port in the lower part and forming a water reservoir chamber between the bowl and an outer case, and a

supporting unit formed intergrally with said bowl unit on the lower surface of the bowl unit, said supporting unit being provided with a dropping port opposed to the discharging port of the bowl, a valve slidable in the horizontal direction when a first pedal located on said supporting unit is trod for opening said dropping port, a diaphragm pump, a means for pressing the diaphragm pump when a second pedal located on said support unit is trod, a means for operating an opening and closing valve to feed water into the diaphragm pump actuated by said pressing means for the diaphragm pump, and a water



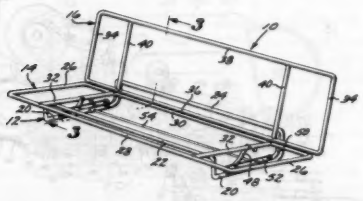
jetting pipe connecting said diaphragm pump and a water delivering port in the upper part of the bowl with each other, said means for pressing forces water from said diaphragm through said water jetting pipe into said bowl, said means for pressing the diaphragm pump and said means for operating the opening and closing valve being connected with each other through a delaying means opening said water feeding valve at a fixed time after said diaphragm pump is pressed and closing said water feeding valve just before said diaphragm pump returns to an initial position.

3,932,902

CONVERTIBLE SOFA BED

Earl H. Belk, Long Beach, Calif., assignor to Kustom Fit Manufacturing Company, Los Angeles, Calif.

Filed Jan. 10, 1975, Ser. No. 539,978
Int. Cl.² A47C *17/40*
U.S. Cl. 5—28 **5 Claims**



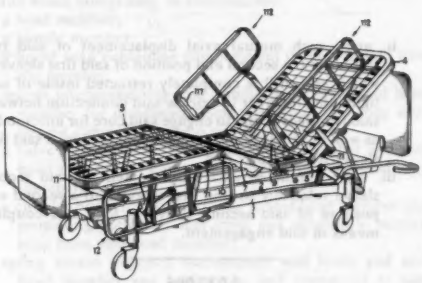
1. A convertible sofa bed comprising:
a frame;
a seat portion;
a back portion pivotally connected to said seat portion for movement about a hinge axis and between generally horizontal and generally upright positions; and
a pair of pivot assemblies, one at each side of said frame and each including a front pivot arm having opposite extremities pivotally connected to said frame and said seat portion, a rear pivot arm having opposite extremities pivotally connected to said frame and said back portion, said front and rear pivot arms being pivotable between raised positions wherein said front and back portions are forwardly projected and said front pivot arm is engaged upon said frame whereby said front pivot arm is prevented from further pivotal movement forwardly, and lowered positions wherein said front and back portions are rearwardly retracted, said rear pivot arm being connected to said back portion adjacent said hinge axis whereby said back portion is upwardly pivoted about said hinge axis in said retracted position, said pivot assemblies also each including a connecting link pivotally connecting said front and rear pivot arms whereby said rear pivot arm is prevented by said connecting link from pivoting forwardly in said raised position of said front pivot arm.

3,932,903

GUARD INCLUDING ELECTRICAL CONTROLS AND SLIDABLE UNDERNEATH THE BED

James S. Adams, Batesville; Leslie Dale Foster, Brookville, and William H. Peck, Batesville, all of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Oct. 4, 1974, Ser. No. 512,312
Int. Cl.² A47D *09/00*; H02P *07/74*
U.S. Cl. 5—100 **11 Claims**



1. In a guard structure for a bed having:
A. body restraining means for preventing unintended egress of an occupant from said bed, said restraining means being movable between an elevated and a lowered position;
B. retaining means coupled to said restraining means for holding said restraining means in an elevated position; and
C. release means coupled to said retaining means for disengaging said retaining means and allowing said restraining means to descend, the improvement comprising moving means for permitting said restraining means to move between an inner limit toward the center and an outer limit away from the center of a bed to which affixed, said moving means prohibiting motion toward the center of said bed beyond a predesignated point located between said inner and outer limits when said restraining means occupies a position substantially above said lowered position.

3,932,904

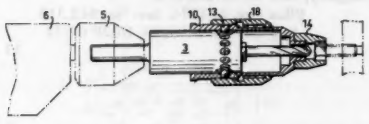
COMBINATION TOOL

Rune Nilsson, Lindesberg, and Ake Jansson, Orebro, both of Sweden, assignors to United Shoe Machinery Company AB, Orebro, Sweden

Continuation of Ser. No. 408,574, Oct. 23, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,645
Claims priority, application Sweden, Oct. 27, 1972, 13908/72
Int. Cl.² B25F *1/00*; B26B *11/00*
U.S. Cl. 7—14.1 R **5 Claims**

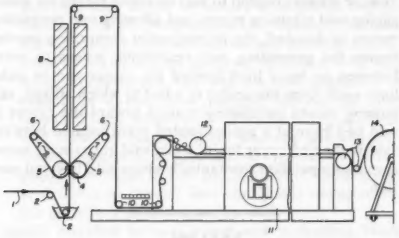
1. A combination tool for providing a bore in a workpiece and for introducing a fastener, preferably a self-threading screw, into said bore, said tool comprising
a. a cylindrical core having at one end a stud shaft adapted to be driven by a driving means and at the other end a central mounting member for a drill;

b. a first sleeve having at one end a tightening member, said first sleeve surrounding said core and being rotatable and axially displaceable relatively thereto;
c. a second sleeve surrouding said first sleeve and being rotatable and axially displaceable thereto; and
d. coupling means which are axially displaceable together with said first sleeve, said coupling means being so arranged that
i. in a first end position of said first sleeve in which said drill protrudes through and beyond said tightening members, and in a first end position of said second sleeve to connect said two sleeves for mutual axial displacement;



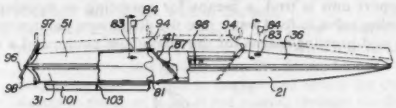
ii. upon such mutual axial displacement of said two sleeves into a second end position of said first sleeve in which said drill is completely retracted inside of said tightening member to release said connection between said two sleeves and to engage said core for unrotatable as well as axially undisplaceable connection of said first sleeve to said core; and
iii. upon continued axial displacement of said second sleeve relatively to said first sleeve into a second end position of said second sleeve to lock said coupling means in said engagement.

3,932,905
METHOD OF DYEING A TEXTILE WEB
Heinz Houben, Monchengladbach, Germany, assignor to A. Monforts, Monchengladbach, Germany
Filed Aug. 19, 1974, Ser. No. 498,532
Claims priority, application Germany, Aug. 21, 1973, 2342128
Int. Cl.² D06B *21/00*
U.S. Cl. 8—149.1 **5 Claims**



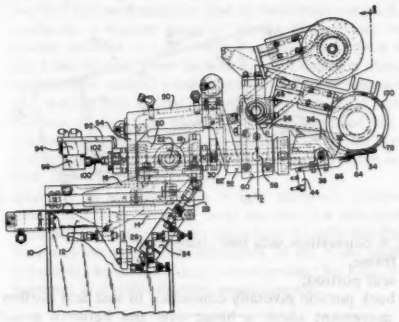
1. Method of dyeing a textile web having a relatively large volume or relief-like construction which comprises immersing the web in a dye solution having a dye concentration corresponding to the quantity of liquid to be squeezed from the web in a subsequent dewatering step, passing the web between two absorbed endless entrainer membrs of a squeeze foulard that are continuously saturated with the dye solution prior to engagement of the endless entrainer members with the web, and squeezing the web in the foulard so as to dewater it to less than substantially 40% moisture with respect to dry weight of the web, then passing the web through an infra-red channel at an adjusted relatively low drying velocity so as to prevent the formation of cloudiness in the dye distribution and drying the web to a final moisture content of at most 5% with respect to dry weight of the web.

3,932,906
COLLAPSIBLE BOAT
Walter E. Johnson, 21 Colorados Drive, Millbrae, Calif. 94030
Filed May 10, 1974, Ser. No. 468,975
Int. Cl.² B63B *7/06*
U.S. Cl. 9—2 C **8 Claims**



1. A collapsible boat comprising a flexible top having front and rear top panels, a flexible bottom having front and rear bottom panels, first transverse hinge means hinging together and permanently securing against detachment said front and rear top panels, second transverse hinge means hinging together and permanently securing against detachment said front and rear bottom panels, whereby when said boat is collapsed it may be folded in half at said transverse hinge means, said top and bottom comprising a prow, a stern and sides, seal means sealing the peripheral edges of said top and bottom panels together, said top cut away for a cockpit opening and having longitudinal edges, and gunwale panels hinged to said longitudinal edges about third hinge means extending longitudinally of said boat, said gunwale panels being depressible to approximately upright position, the height of said gunwale panels relative to said third hinge means causing said top and bottom to be forced apart from each other, said top and bottom thereby flexing so that said top and bottom are outwardly convex and having an axis of curvature extending longitudinally of said boat.

3,932,907
ROUGHING MACHINE
Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.
Filed Feb. 3, 1975, Ser. No. 546,223
Int. Cl.² A43D *95/00*
U.S. Cl. 12—1 R **2 Claims**



1. A machine for roughing the margin of an upper of a shoe assembly, said shoe assembly comprising a last having an insole located on its bottom and the upper mounted thereon with the upper margin lying against and being secured to the periphery of the insole, comprising: a shoe assembly support for supporting the shoe assembly bottom-up; a slide mounted for forward-rearward movement toward and away from the shoe assembly; a first motor connected to the slide for effecting said forward-rearward movement; a tool mount mounted to the slide for heightwise movement; a second yieldable motor connected to the tool mount for effecting said heightwise movement; a tine mounted to the tool mount; a sensing

member mounted to the tool mount below the tine; actuable operating means so connecting the sensing member and the first motor as to cause the first motor to move the slide from a rearward idle position wherein the sensing member is spaced from the shoe assembly forwardly until the sensing member engages a particular portion of the side of the shoe assembly and to enable the first motor to retain the sensing member in engagement with successive portions of the side of the shoe assembly with a consequent forward or rearward movement of the tool mount as the successive portions of the side of the shoe assembly move past the sensing member; means for initially deactuating the operating means so that the first motor retains the slide in said idle position; means for initially causing the second motor to retain the tool mount in an upper position spaced above the shoe assembly; means for causing the second motor to yieldably lower the tool mount so as to bring the tine into engagement with the bottom of the shoe assembly; triggering means responsive to the engagement of the tine with the bottom of the shoe assembly to actuate said operating means; means operative to thereafter so move the shoe assembly support as to move successive portions of the shoe assembly past the tool mount thereby moving successive portions of the side of the shoe assembly past the sensing member and thereby moving successive portions of the bottom of the shoe assembly past the tine; and a roughing tool so mounted to the tool mount as to be in engagement with successive portions of the upper margin as said successive portions of the shoe assembly move past the tool mount.

3,932,908

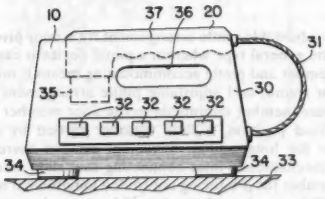
PORTABLE SCRUBBING DEVICE

Andrew J. Bitgood, and Roger T. Bellavance, both of Moosup, Conn., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 20, 1974, Ser. No. 452,965

Int. Cl.² A46B *13/02*

U.S. Cl. 15—28 **1 Claim**



1. A compact portable scrubbing or stirring device comprising a housing member, a handle member and a detachable rotary tool,

said housing member incorporating a motor and gear unit linked to a flexible drive shaft which leads from the housing member into the handle member,

said handle member fitted with an output shaft rotatably mounted to said handle member, said output shaft linked inside the handle member to said flexible drive shaft, with said output shaft shaped, externally of the handle member, to engage a socket in said detachable rotary tool, in which a surface of the housing is formed with a recess of a shape to fit the handle member and an attached detachable rotary tool, with the bottom of said recess linked by a drain hole through the housing to the exterior of the housing, so as to drain excess water from the recess.

3,932,909

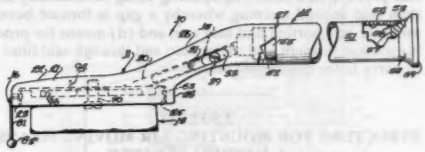
PERSONAL SELF-POWERED SCRUB BRUSH

George Beldon Johnson, and Virginia M. Johnson, both of 218 N. 7th St., Avondale, Ariz. 85323

Filed Oct. 25, 1974, Ser. No. 517,954

Int. Cl.² A46B *13/06*

U.S. Cl. 15—29 **7 Claims**



1. A personal self-powered scrub brush intended for use by individuals for scrubbing and cleansing of their bodies, the scrub brush comprising, in combination:

a head member;

a handle member;

a liquid soap containing compartment defined in said handle member;

means interconnecting said handle member to said head member for dispensing liquid soap from said soap containing compartment into said head member;

a valve interposed between said handle member and said head member for controlling the flow of said liquid soap therebetween;

a circular brush rotatively affixed to said head member and projecting outwardly therefrom and adapted to receive soap from said head member;

spring means disposed intermediate said brush and said head member and having one end connected to said brush and the opposite end connected to said head member for effecting winding of the spring by rotation of said brush in a first direction, with said wound spring effecting rotation of said brush in the opposite direction during unwinding of said spring; and

a flexible cord wrapped about said brush and extending outwardly of said head member and adapted for use in the rotation of said brush in a direction to wind said spring means with said cord being automatically rewound about said brush as said spring means unwinds and rotatively drives said brush.

3,932,910

TONER CLEANING APPARATUS IN ELECTROPHOTOGRAPHIC COPYING MACHINE

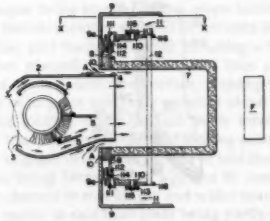
Kazuho Shimoda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sept. 10, 1974, Ser. No. 504,713

Claims priority, application Japan, Sept. 10, 1973, 48-101222

Int. Cl.² G03G *15/00*

U.S. Cl. 15—301 **2 Claims**



1. An improved cleaning apparatus for an electrophotographic copying device which comprises (a) a cleaning brush,

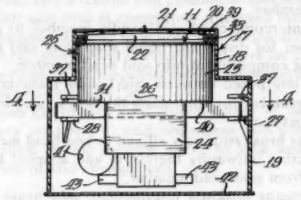
(b) a casing for said brush having a front end portion which forms a first opening and a rear end portion which forms a second opening adapted to pass a toner therethrough, said brush within said casing and positioned adjacent said first opening so as to be adapted to contact a work surface, (c) a filter bag having a rim which forms an opening adapted to pass toner therethrough and which substantially overlaps said rear end portion, said filter bag opening being substantially larger than said second opening whereby a gap is formed between said rear end portion and said rim, and (d) means for producing suction through said casing into and through said filter bag to carry toner-containing air.

3,932,911

STRUCTURE FOR MOUNTING AIR MOVING MEANS IN A VACUUM CLEANER

Stanley R. Crooks, Shakopee, and Warren H. Fish, White Bear Lake, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,917
Int. Cl.² A47L 9/22
U.S. Cl. 15—327 D **17 Claims**



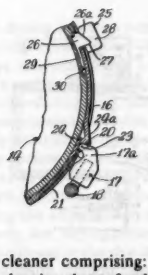
10. Structure for mounting a suction means including an air moving means and an electric drive motor in a vacuum cleaner comprising: housing means including an integral portion defining an air flow passage having an inlet and outlet and flange means adjacent said inlet; means defining a plurality of retaining shoulders integral with said air flow passage means; bracket means resting on said mounting shoulders and retaining said suction means in said air flow passage for drawing air through said inlet and discharging it through said outlet; and resilient means interposed between said flange and said suction means biasing said suction means downwardly against said bracket means for retaining said bracket means against said mounting shoulders.

3,932,912

VACUUM CLEANER

Robert E. Johnson, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 15, 1974, Ser. No. 442,799
Int. Cl.² A47L 9/32
U.S. Cl. 15—410 **11 Claims**



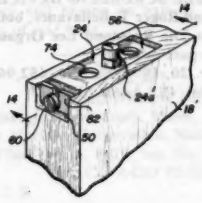
1. A vacuum cleaner comprising: a cleaning unit movable over a floor for cleaning thereof; a handle structure for moving said cleaning unit including a handle and means swingably mounted to said cleaning unit for movement of said handle between an upper operating position and a lower operating position; and cooperating means on said cleaning unit and handle structure for selectively retaining the handle in an intermediate position intermediate said upper and lower operating positions including first stop shoulder means defining a first stop shoulder on said cleaning unit, and second stop shoulder means defining a second stop shoulder on said handle structure, and manually operable means for selectively fixedly positioning said second stop shoulder on said handle in a retaining position or in a retracted position, said first stop shoulder being disposed in the path of movement of said second stop shoulder when said second stop shoulder is selectively disposed in the retaining position while permitting a preselected limited movement of said handle relative to said cleaning unit in said upper operating position, said first stop shoulder being disposed out of the path of movement of said second stop shoulder when said second stop shoulder is selectively disposed in the retracted position to permit said handle to be brought to said lower operating position.

3,932,913

PIVOT ASSEMBLY

Larry K. Johnson, Morrison, Ill., assignor to Lawrence Brothers Inc., Sterling, Ill.

Division of Ser. No. 449,321, March 11, 1974, which is a continuation-in-part of Ser. No. 352,878, April 20, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,789
Int. Cl.² E05D 7/04
U.S. Cl. 16—130 **5 Claims**



1. An adjustable pintle arrangement for a door pivot assembly of the general type wherein a pintle device is carried by a door member and pintle accommodating means is mounted to the door frame, said adjustable pintle arrangement comprising, a base member mountable to the door member in a relatively fixed position, a slide member carried by said base member for longitudinal movement relative thereto, drive means mechanically inter-connecting said slide member and base member for producing controlled longitudinal movement of said slide member relative to said base member, and a pintle device carried by said slide member and projecting therefrom, such that operation of said drive mechanism will produce relative longitudinal movement of said pintle device with respect to said base member, said slide member including an aperture formed therein, said pintle device being disposed in said aperture, and spring means biasing the said pintle device outwardly of said slide member so as to project from the upper surface thereof.

3,932,914

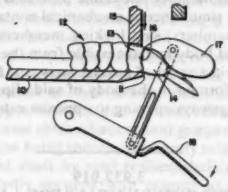
CONDYLE HINGE BREAKING DEVICE

Fernand S. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed May 28, 1974, Ser. No. 473,939
Int. Cl.² A22C 29/00
U.S. Cl. 17—71 **4 Claims**

1. A condyle hinge breaking device comprising a shrimp support upon which a shrimp is fed axially along its major axis positioned ventral side down with the joint between the 5th

and 6th shell segments immediately above the terminus of the support, axial position holding means above the fifth shell segment and engagable therewith to prevent motion of the shrimp along its longitudinal axis, and pressure means positioned relative to the sixth shell segment to move the sixth shell segment in the dorsal to ventral direction and further wrap the sixth segment under the support terminus to insure breaking of the 5–6 condyle joint.



3,932,915

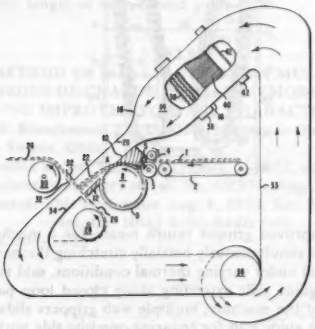
AIR-LAYDOWN APPARATUS FOR FORMING UNIFORM WEBS OF STAPLE FIBERS

Rashmikant M. Contractor, Wilmington, and Sang-Hak Hwang, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Aug. 9, 1974, Ser. No. 497,046

Int. Cl.² D01G *25/00*

U.S. Cl. 19—156.3 3 Claims



1. In an air-laydown apparatus for forming a web of staple fibers which comprises duct means for conveying fibers in a stream of air, a rotating toothed disperser roll and coacting stationary disperser plate for projecting fibers through an opening in the duct means to form a stream of fibers in the stream of air, condenser means for separating the fibers from the air to form a web, and air supply means which includes a highly uniform air passage with a larger cross-sectional area than said duct means connected directly to the duct means by a converging section in the form of a smooth, gradual curve, in combination with screens and a honeycomb structure located in the larger air passage to provide a uniform flow substantially free of turbulence and vorticity; the improvement for high speed production of highly uniform webs which comprises grooves in the stationary disperser plate extending across the plate in a direction transverse to the rotational direction of the roll for generating a high intensity of air turbulence between the disperser roll and plate, the percent turbulence being at least 25 when the roll is rotating at a surface speed of about 315 feet per second.

3,932,916

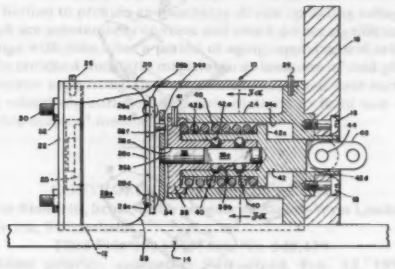
CAPTIVE ELEMENT RELEASE MECHANISM

Curtis K. Baker, 25 Tally Ho Drive, Warminster, Pa. 18974

Filed Nov. 4, 1974, Ser. No. 520,315

Int. Cl.² G05G *5/06*; A44B *17/00*

U.S. Cl. 24—211 N 4 Claims



1. An apparatus comprising:

a barrel member having a shank, an axial bore through the shank and a plurality of radial apertures communicating with said axial bore;

a locking member mounted in each of said plurality of apertures for radial movement between a retracted position within said shank and a locking position extending radially from said shank;

a control blade rotatably mounted in the axial bore and having a control surface for cam action against said locking members to urge the locking members from said retracted position to said locking position, said control blade comprising two substantially rectangular parallel surfaces joined at the extremities thereof by two arcuate surfaces wherein each of said arcuate surfaces has a first portion intermediate its ends having a radius equal to the radius of the control shaft and second and third portions each extending from said first portion to a respective one of said two parallel surfaces along an arc having a radius less than the control shaft radius; and

means operatively connected to said control blade for rotating said control blade.

3,932,917

BUCKLE ASSEMBLY FOR MOTOR VEHICLE SAFETY BELTS

Jochen Dobelmann, Schwäbisch-Gmünd-Lindach, Germany, assignor to REPA GmbH Feinstanzwerk, Schwabisch-Gmund-Lindach, Germany

Filed Dec. 30, 1974, Ser. No. 537,387

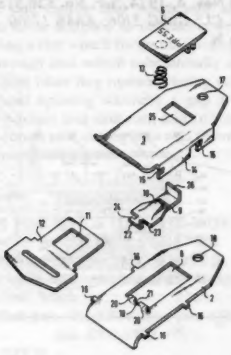
Claims priority, application Germany, Dec. 31, 1973, 2365250

Int. Cl.² A44B *11/26*

U.S. Cl. 24—230 A 3 Claims

1. Buckle assembly for motor vehicle safety belts comprising a buckle member and an insert tongue secured to a belt, said insert tongue being insertable in a given insertion direction into said buckle member so as to be secured in a locking position therein, said buckle member including a base plate, a latch member pivotally mounted on said base plate transversely to said given insertion direction, a spring-biased key depressible so as to pivot said latch member about said insert tongue in said locking position, said latch member being formed with a latch nose which, in said locking position of said insert tongue, engages in a recess formed in said insert tongue, said base plate being formed with a recess in a substantially central region thereof that is longer and wider than said latch member, said recess in said base plate being partly defined by a forward edge formed with ears having an open gap therebetween and bent at an angle initially outwardly and, in a free marginal region thereof, in said given insertion direction of

said insert tongue, said latch member being formed with a hammerhead-like projection having a neck portion extending



through said gap between said ears and, with said hammerhead portion thereof, engaging said ears from behind at the outside of said base plate.

3,932,918

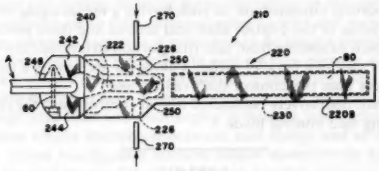
RELEASABLY ATTACHABLE CLIP

Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Ohio

Division of Ser. No. 365,943, June 1, 1973. This application Aug. 15, 1974, Ser. No. 497,589

Int. Cl.² A44B *21/00*

U.S. Cl. 24—260 **2 Claims**



1. A clip for releasable attachment to an article to be monitored, said clip comprising:

a body for encapsulating receipt of a monitor activating device; and

a normally V-shaped attachment member mounted in said body, said attachment member having a first position in which the free ends of the legs of said V-shaped member are separated for release of said article and a second position wherein the free ends of the legs of the V-shaped member are urged towards one another for releasable attachment to said article, said V-shaped attachment member including a pin extending from the free end of one of the legs and a pin receiving cavity in the free end of the other leg, said pin receiving cavity receiving said pin when said V-shaped member is in said second position;

said body defining a cavity opening to the exterior of said body in which said V-shaped attachment member is mounted, said V-shaped attachment member in said first position retained in said body by means of a shaft engaging the base of said V-shaped member, the walls of said cavity defining generally inwardly tapering surfaces which will cammingly engage the normally resiliently separated legs of the V-shaped attachment member to urge said legs together as said V-shaped attachment member is urged into said cavity to assume its said second position, said V-shaped attachment member and said body defining a plurality of mating resilient locking members and resilient locking member catches which will releasably engage when said V-shaped attachment member is in said second position to lock said V-shaped attachment member in said second position, said V-shaped attachment member releasable from said second position only upon simultaneous mechanical contact on all of said locking members, said locking members located interiorly of said body and accessible from the exterior of said clip only via a series of passageways, one for each locking member, formed in the body of said clip, at least two of said passageways opening to opposite exterior surfaces of said body.

3,932,919

GRIPPER RETURN MEANS FOR A MACHINE FOR SIMULTANEOUSLY BIAXIALLY STRETCHING THERMOPLASTIC FILM

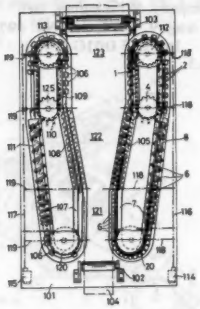
Armin S. P. Hutzenlaub, Wiehl, Germany, assignor to Erwin Kampf Maschinenfabrik, Wiehl, Germany

Continuation-in-part of Ser. No. 200,499, Nov. 19, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,797

Claims priority, application Germany, Nov. 26, 1970, 2058262

Int. Cl.² D06C *3/00*

U.S. Cl. 26—57 R **8 Claims**



1. An improved gripper return means for a machine for treating and simultaneously biaxially stretching thermoplastic web material under varying thermal conditions, said machine including: guide rails extending along closed loop paths on each side of the machine, multiple web grippers slidably secured to the guide rails for engaging opposite side portions of web material to be treated in the machine, transport means for the grippers on each side of the machine, the transport means each comprising, in sequence about the guide rail paths, gripper infeeding means for infeeding grippers on the guide rails to the working stretch of the machine at a first velocity, a gripper advancing drive means for progressively increasing the speed of the grippers along the guide rails to a second velocity and thereby extending the spacing between the grippers along the guide rails, a gripper return feeding means for advancing grippers received from said gripper advancing drive means in a reverse direction at said second velocity, and a gripper return means for receiving grippers from said gripper return feeding means at said second velocity and advancing the grippers to a gripper storage area along said guide rails at a progressively decreasing velocity, whereby the grippers may be supplied to the gripper infeeding means at said first velocity; said improved gripper return means each comprising a variable length screw comprising an elongated shaft extending along a portion of said guide rail and being driven synchronously with said gripper return feeding means; said shaft having a sleeve having a helical gripper advancing cam on its periphery, said sleeve being slidably mounted adjacent one

end of said shaft but fixed for rotation therewith adjacent a gripper storage area, the gripper storage area being defined as an area between said sleeve and said gripper infeeding means along a portion of said guide rail, said helical gripper cam having a progressively decreasing lead for progressively slowing the advancing speed of each gripper element advanced along said sleeve before said grippers are advanced to said storage area; said shaft furthermore having a resilient helical guide means in the form of a coil spring concentrically mounted thereon on the side of said sleeve towards said gripper return feeding means; means for securing one end of said helical guide means to said sleeve, and means for fixedly securing the opposite other end of said helical guide means with respect to said shaft adjacent said gripper return feeding means, said sleeve being thereby resiliently retained in an axial sense along said shaft by said resilient helical guide means while being fixedly secured with respect to said shaft in a rotational sense; a driving protrusion on each of said grippers for enabling the advancement thereof by said transport means; said resilient helical guide having a helical cam surface of uniform pitch for engaging said gripper protrusion and advancing each gripper from said gripper return feeding means to said sleeve when said shaft is rotated; said sleeve and said resilient helical guide being joined together so as to permit advancement of said protrusion of each gripper continuously along said shaft without interruption when said shaft is rotating; said sleeve slowing down the velocity of each gripper advanced thereby to said storage space and being resiliently urged against the last-advanced gripper in said storage space in an axial direction along said shaft by said resilient helical guide means when a predetermined number of grippers are in said storage area in abutting relationship along said guide rail to thereby ensure reliable seizure of grippers in said storage area by said gripper infeeding means and to compensate for thermally induced variations of said gripper transport means along the length of each of said guide rails.

3,932,920

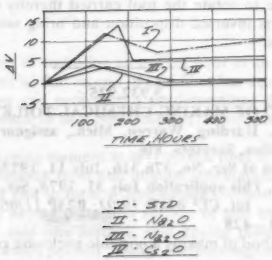
METHOD OF MANUFACTURING A MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING IMPROVED VOLTAGE CHARACTERISTICS

Roger E. Ernsthausen, Lucky, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 293,817, Oct. 2, 1972, which is a continuation-in-part of Ser. No. 60,376, Aug. 3, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 385,741

Int. Cl.² H01J 9/00; B44D 1/02

U.S. Cl. 29—25.11 **2 Claims**



I · STD
II · Na_2O
III · Na_2O
IV · Cs_2O

1. In the manufacture of a multiple gas discharge display/memory device comprising an ionizable gaseous medium in a gas chamber formed by a pair of opposed dielectric material members, each backed by an array of electrode members, each said dielectric material and array of electrode members being backed by a glass substrate, the electrode members behind each dielectric material member being transversely oriented with respect to the electrode members behind the opposing dielectric material so as to define a plurality of discharge units, the surfaces of said dielectric material members serving to store charges during each half-cycle of operation, the improvement comprising selectively enriching an uncured dielectric material with about 0.5 to about 8 weight percent, based on the total weight of the dielectric material, of at least one element in the oxide state and selected from the group consisting of lithium, sodium, potassium, rubidium, cessium, francium, beryllium, magnesium, calcium, strontium and barium to provide gas discharge device operating voltages which are substantially uniform and which do not significantly change with time after a period of aging, applying said selectively enriched dielectric material to at least one of said glass substrates supporting an array of electrodes, and heat curing said selectively enriched dielectric material to form said dielectric material member.

3,932,921

CONTROLLED DEFLECTION ROLL

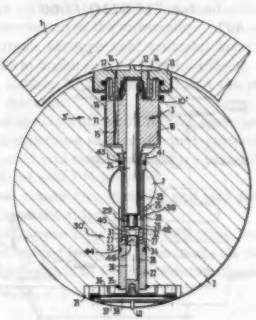
Mario Biondetti, Schio, Italy, assignor to Escher-Wyss Limited, Zurich, Switzerland

Filed Feb. 10, 1975, Ser. No. 548,419

Claims priority, application Switzerland, Feb. 12, 1974, 1921/74

Int. Cl.² B21B 13/02

U.S. Cl. 29—116 AD **7 Claims**



1. A roll comprising a beam, a hollow roll shell surrounding the beam, a plurality of fluid-actuated shell supporting elements arranged on the beam, said beam having arranged thereon a pressure fluid duct and a separate duct connecting from each of said elements to said pressure fluid duct, said roll further comprising adjustable remotely controllable flow control means in at least one of said separate ducts.

3,932,922

PIPE SYSTEMS FOR HOT MEDIA

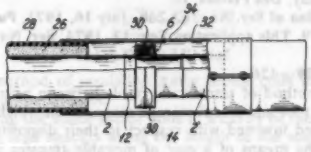
Ove Thastrup, Fredericia, Denmark, assignor to A/S E. Rasmussen, Denmark

Filed Apr. 22, 1974, Ser. No. 463,184

Claims priority, application United Kingdom, Apr. 26, 1973, 19907/73

Int. Cl.² B23P 11/00; B21D 39/04; F16L 1/02

U.S. Cl. 29—405 **8 Claims**



1. A method of laying pipe systems for conducting a hot

fluid, such as subterranean heating pipe systems, the method comprising the steps of:

disposing a plurality of fluid conducting lengths of pipe in axial alignment, with the ends of adjacent pipe lengths being spaced at a predetermined distance;

providing axially compressible fluid conductor elements between said adjacent pipe length ends which interconnect said lengths of pipe to form a fluid-tight connection therebetween;

axially expanding said lengths of pipe by conducting a hot fluid, at a temperature below the expected maximum operational temperature of the pipe system, through the assembled fluid conducting lengths of pipe and fluid conductor elements until the ends of adjacent pipe lengths are brought into engagement thereby compressing the axially compressible fluid conductor elements; and

securing the lengths of pipe by rigidly joining the engaged ends thereof in a sealed manner.

3,932,923

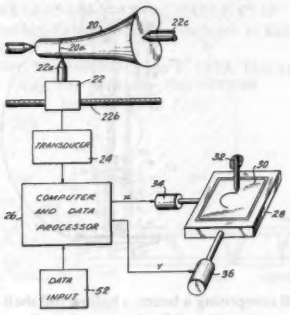
METHOD OF GENERATING AND CONSTRUCTING THREE-DIMENSIONAL BODIES

Paul L. DiMatteo, Huntington, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,373

Int. Cl.² B23Q *17/00*

U.S. Cl. 29—407 **8 Claims**



1. A method for constructing a predetermined surface comprising the steps of: defining the surface to be constructed; measuring a plurality of cross-sections of said defined surface; generating a substantially planar element for each cross-section measured, each said element having a cross-section corresponding to the respective measured cross-section of said defined surface; and stacking the generated elements adjacent one another in predetermined sequence to form said surface, the sequence of the stacked generated elements corresponding to the sequence of said plurality of cross-sections of said defined surface.

3,932,924

METHOD OF CHANGING TOOLS

William T. Anderson, Arlington Heights, Ill., assignor to Doall Company, Des Plaines, Ill.

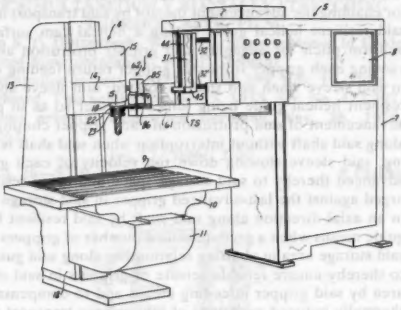
Division of Ser. No. 163,268, July 16, 1971, Pat. No. 3,811,179. This application Feb. 12, 1974, Ser. No. 441,857

Int. Cl.² B23Q *3/157*

U.S. Cl. 29—426 **3 Claims**

1. A method of transferring tools between a spindle of a machine tool and a tool storage magazine in which the tools are carried inverted with respect to their disposition in the spindle, by means of a pair of movable transfer arms each having tool gripping means thereon which method is characterized by

1. while the spindle is rotating and a tool held thereby is performing a machining operation on a workpiece, moving said transfer arms towards the tool storage magazine as required to bring the tool gripping means on one of said arms into position to grasp the tool which is to perform the next machining operation on the workpiece;
2. actuating the gripping means on that transfer arm to cause it to grasp said tool and hold it in inverted disposition;
3. moving said transfer arms along a linear path with respect to both the tool storage magazine and the spindle to carry said tool while still inverted towards the spindle and then hold it at a tool-ready position from which said tool can be substituted for the one performing a machining operation as soon as that operation is completed, the spindle stops and the tool therein is removed;



4. moving the transfer arms to bring the other of said arms into juxtaposition to the spindle with its tool-gripping means closely adjacent to the tool held by the spindle;
5. as soon as the spindle stops, grasping the tool held by the spindle with the tool gripping means of said other transfer arm;
6. swinging said other transfer arm about an axis spaced from and lying in a plane normal to the axis of the spindle to thereby remove the tool in the grasp of its tool-gripping means from the spindle;
7. moving the transfer arms to bring the first identified transfer arm into juxtaposition to the spindle; and
8. swinging said first identified transfer arm about an axis spaced from and lying in a plane normal to the axis of the spindle to rotate the tool carried thereby end-over-end from its inverted disposition and bring said tool to the spindle.

3,932,925

METHOD OF MAKING CHEMICAL TOILET CABANA

George W. Harding, Warren, Mich., assignor to Poly-San Corporation, Sarasota, Fla.

Division of Ser. No. 378,316, July 11, 1973, Pat. No. 3,835,480. This application July 31, 1974, Ser. No. 493,256

Int. Cl.³ B21D *39/03*; B23P *11/00*

U.S. Cl. 29—428 **5 Claims**

1. A method of making a portable enclosure comprising the steps of:

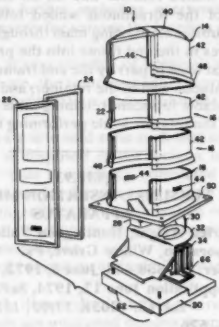
forming at least two identical shell sections, each having a dome-like roof, a side wall terminating in a bell-like enlarged lower end, and a base flange extending outwardly from the lower end of said side wall;

removing the base flange from a first section to form a shell top;

removing the dome-like roof from a second section to form a shell bottom; and

stacking said first section on said second section with the wall of said second section fitting within the enlarged

lower end of said first section, and with the walls of said first and second sections being substantially in vertical alignment,



whereby said enlarged lower end serves as a louver to restrict moisture from entering said shell bottom.

3,932,926

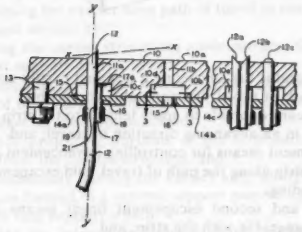
METHOD OF MAKING OPTICAL FIBER MOUNTING ARRANGEMENT

Martin Dotsko, Binghamton, N.Y., assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 397,148, Sept. 13, 1973. This application Feb. 3, 1975, Ser. No. 546,745

Int. Cl.² B23P *11/02*

U.S. Cl. 29—447 **9 Claims**



1. A method of mounting an optical fiber in an aperture of a base member so that an end of said fiber has a precise angular orientation and protrudes a predetermined distance beyond one surface of said base member, comprising the steps of:

affixing a keying element to said optical fiber at a predetermined distance from and angular orientation relative to said fiber end to form a fiber-keying element assembly;

attaching a keying plate to a surface of said base member opposite said one surface, said keying plate having an opening which permits passage therethrough of said fiber-keying element assembly but restricts the rotational movement of said assembly about the fiber axis, a portion of the opening in the attached plate registering with the aperture in said base member; and

inserting said fiber-keying element assembly through the opening in said keying plate so that said fiber extends through the aperture in said base member and said keying element abutts against said base member, whereby the end of said fiber is positioned with a precise angular orientation and protrusion relative to said one surface of said base member.

3,932,927

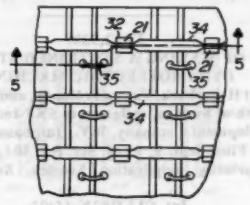
SCANNABLE LIGHT EMITTING DIODE ARRAY AND METHOD

Lawrence A. Grenon, Phoenix, and Michael G. Coleman, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 337,818, March 5, 1973. This application Mar. 29, 1974, Ser. No. 456,117

Int. Cl.² B01J *17/00*

U.S. Cl. 29—577 **2 Claims**



1. A method of manufacturing a monolithic light emitting diode display comprising:

depositing an epitaxial layer of a first conductivity semiconductor material upon the substrate;

etching channels through said epitaxial layer to the substrate to form a plurality of parallel ridges;

coating the surface of the channels and the ridges with a dielectric material;

filling said channels with a conductive material;

electrically connecting said conductive material to at least one portion of said ridge to form an electrical connection to one side of said PN junction;

removing said conductive material and said dielectric from the surface of the ridges; and

diffusing an opposite conductivity affecting material into a plurality of spaced locations in each of said ridges to form an othagonal matrix of PN junctions in the surface of the epitaxial layer.

3,932,928

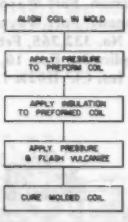
METHOD OF INSULATING STATOR COILS

George E. S. King, Trinidad, British W. Indies, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1974, Ser. No. 430,369

Int. Cl.² H02K *15/04*

U.S. Cl. 29—596 **2 Claims**


ALIGN COIL IN MOLD
APPLY PRESSURE TO PREFORM COIL
APPLY INSULATION TO PREFORMED COIL
APPLY PRESSURE & FLASH VULCANIZE
CURE MOLDED COIL

1. A method of insulating stator motor coils in a mold, comprising the steps of:

centering the stator motor coils in a cavity of the mold;

placing lead spacers along the length of the stator motor coils and the lead wires thereof;

applying high pressure to the mold for preforming the stator motor coils;

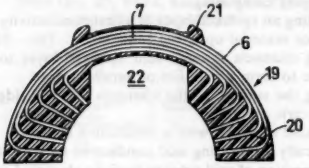
skip-lapping a fiberglass tape around the preformed stator motor coils;
butt-lapping a silicone rubber tape over the skip-lapped fiberglass tape around the preformed stator motor coils;
placing the mold containing the silicone butt-lapped stator motor coils in a preheated platten of a hydraulic press;
applying pressure to the mold while placed on the preheated platten of the hydraulic press;
releasing the pressure applied to the mold;
removing the mold from the preheated platten of the hydraulic press; and curing the molded stator motor coils in a oven.

3,932,929

METHOD OF MAKING A SECTIONED STATOR FOR A DYNAMOELECTRIC MACHINE

Stig Lennart Hallerback, Vastra Frolunda, and Leif Lachonius, Surte, both of Sweden, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Sept. 9, 1974, Ser. No. 504,460
Claims priority, application Sweden, Sept. 28, 1973, 7313243
Int. Cl.² H02K *15/02*
U.S. Cl. 29—596 **11 Claims**



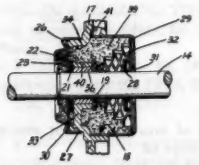
1. A method of manufacturing rotating electric machines comprising a stator and a rotor, said stator consisting of at least two sections, each section having magnetic flux providing means embedded in a plastic mass, said mass having a predetermined shape corresponding to a portion of the complete, assembled stator, consisting of the steps of forming said stator sections by permanently embedding in a plastic mass at least the means providing the magnetic flux and shaping said plastic mass to said predetermined shape, positioning the stator sections such that they circumscribe the rotor and thereafter securing the stator sections in a fixed position relative to one another.

3,932,930

METHOD OF MAKING DYNAMOELECTRIC MACHINES AND ASSEMBLIES THEREFOR

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 332,265, Feb. 14, 1973, Pat. No. 3,891,878. This application Dec. 16, 1974, Ser. No. 532,868
Int. Cl.² H02K *15/14*
U.S. Cl. 29—596 **5 Claims**



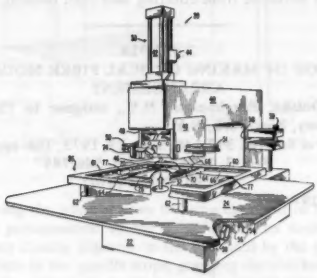
1. A method of manufacturing an end frame assembly for a dynamoelectric machine having a lubricant reservoir and an extrudable lubricant retaining mass therein, the method comprising assembling together an end frame and a foraminous walled retainer, and thereby establishing a predetermined locale for a lubricant retaining mass on a first side of the formainous walled retainer and an oil slinger cavity on the other side of the foraminous walled retainer; extruding an extrudable lubricant retaining mass through at least two extrusion apertures in the end frame into the predetermined locale determined at least in part by the end frame and at least in part by the foraminous wall of the retainer; and restricting the flow of the extrudable lubricant retaining mass beyond the foraminous wall of the retainer while performing the extruding step.

3,932,931

POST TERMINAL INSERTION METHOD AND APPARATUS

Robert Charles Wright, Huntingdon Valley, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Division of Ser. No. 368,448, June 8, 1973, Pat. No. 3,837,063. This application June 12, 1974, Ser. No. 478,692
Int. Cl.² H05K *13/02, 13/04*
U.S. Cl. 29—626 **18 Claims**



1. Apparatus for advancing a terminal carrier strip along a guided path of travel, the apparatus comprising:
feed means operable to apply tension to the strip urging the strip in an advancing direction of travel; and
escapement means for controlling advancement of the carrier strip along the path of travel, said escapement means including:
first and second escapement finger means alternately engageable with the strip; and
each of said first and second finger means being arranged, when in engagement with said strip, to resist said tension and prevent advancement of said strip by said feed means; and
escapement finger control means establishing alternate engagement of said first and second escapement finger means with the strip, to provide incremental advancement of the strip by said feed means during a period when both of said finger means are disposed out of engagement with said strip.

7. Apparatus for insertion of terminals into a substrate, the apparatus comprising:
movable ram arm means engageable with terminals for insertion thereof into the substrate;
said ram arm means including a nose section comprised of an integral body section having coupled thereto a removable resilient insert for defining a terminal receiving aperture opening therebetween, for resiliently gripping a received terminal;
said body section including an aperture;
said insert including a tab extending generally transversely relative to the direction of ram movement and into said aperture;

securing means engaging said insert at a location remote from said tab to hold said insert in place;

said tab defining a shoulder limiting the depth of reception of the terminal in said terminal receiving opening; and

said nose section further including apertures cooperable with selected inserts for varying the location of said shoulder.

13. In a method of ram insertng of terminals supported by a strip into a substrate, the improvement comprising:

providing a zone for location of the substrate for terminal reception,

inserting a substrate into said zone such that an aperture of said substrate is disposed in the vicinity of a movable sensing finger that is operably connected to a power control mechanism for the ram; and

employing said finger to condition activation of the ram by:

disabling ram activation in response to sensing of improper substrate location.

maneuvering said substrate and said finger relative to one another from

an improperly disposed orientation wherein said aperture and pin are unaligned causing depression of said finger to disable ram activation, to

a proper orientation wherein said aperture and pin are aligned, permitting extension of said finger into said aperture to allow ram activation.

14. A method of establishing a path of travel for a terminal carrier strip, said strip being comprised of a flexible elongate member of generally U-shaped cross section defined by a base and contiguous spaced legs having support portions deflectable by ram means operable to remove terminals from the strip and directly insert them into a substrate, said support portions of the legs releasably mounting a plurality of terminals generally orthogonally to strip extent, with the terminals extending between and projecting beyond both legs, the method comprising:

establishing first and second guide channel sections separated by a terminal removal and insertion zone,

constraining the carrier strip path of travel in the first guide channel section by:

passing the carrier strip along guide surfaces formed in a first support portion which:

guide the base of the carrier and the external portions of both carrier strip legs along their extent from that base to the terminals, and

guide projecting portions of the terminals extending from the carrier strip legs; and

simultaneously passing the carrier strip along guide surfaces formed in a second support portion spaced from said first support which:

guide the internal portions of both carrier strip legs along their extent projecting beyond the terminals, and

guide an extent of the terminals situated between the carrier strip legs and facing away from the base of the carrier strip;

constraining the carrier strip path of travel in the second guide channel section by:

passing the carrier strip along guide surfaces formed in said first support portion which:

guide the base of the carrier strip and deflected portions of one of the strip legs adjacent their juncture with that base, while deflected portions of the other strip legs remain essentially free from guidance, and

simultaneously passing the carrier strip along a guide surface formed in said second support portion which:

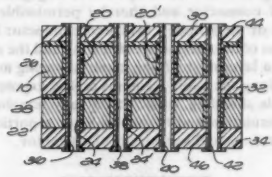
guides the deflected portions of said one of the strip legs adjacent their ends;

the constraint of the carrier strip path of travel in the first and second sections being sufficient to constrain the carrier strip and supported terminals against significant twisting and significant excursion laterally and transversely of the extent of the strip threaded in said guide channel, while providing clearance accommodating flexibility of the strip and limiting binding during travel thereof.

3,932,932
METHOD OF MAKING MULTILAYER PRINTED CIRCUIT BOARD

David S. Goodman, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,058
Int. Cl.² H05K *3/00*
U.S. Cl. 29—625 **7 Claims**



1. A method of making a multilayer printed circuit board comprising the steps of:

providing at least two individual metal sheets of a thickness which, if etched, would have an under-etch condition;

simultaneously punching a plurality of clearance holes in one of said sheets in a first predetermined pattern;

simultaneously punching a plurality of clearance holes in the other of said sheets in a second predetermined pattern;

filling said clearance holes with an insulative material;

stacking said sheets with an insulative inner layer therebetween and insulative outer layers on the top and bottom thereof with at least some of the clearance holes in the respective sheets misaligned;

laminating said stack of sheets and layers together to provide a unitary assembly;

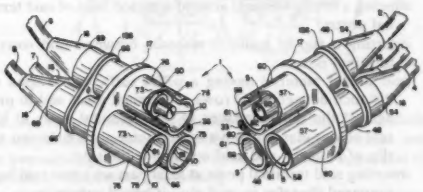
drilling holes vertically through said stack coaxial with the clearance holes in each of said sheets, said through holes having a diameter less than that of said clearance holes; and

plating through said through holes with a conductive material.

3,932,933
HIGH VOLTAGE CABLE COUPLER WITH TERMINATION ADAPTOR AND METHOD OF CONSTRUCTING CABLE TERMINATION

Roy M. Broad, Sagamore Hills, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Oct. 4, 1973, Ser. No. 403,455
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **14 Claims**



1. Method of constructing a high voltage cable termination with a cable having at least one outer layer containing conduc-

tive shielding properties overlying an insulative covered conductor comprising the steps of

stripping from the terminal end of the cable a portion of the conductive shielding exposing the conductor insulation,

stripping from the immediate terminal end of the cable a portion of the cable insulation,

inserting the stripped insulated portion into an elongated elastomeric adaptor having a central bore and two oppositely opposed frusto-conical surfaces with the smaller diametrical extent of each surface at opposite ends thereof,

securing an electrical connector to the stripped conductor,

positioning the inserted adaptor into engagement with the secured connector and thereby permissible exposing a portion of the stripped insulated conductor between the terminus of the conductive shielding and the adaptor, and

Applying a layer of shielding material having metallic properties along the cable terminus on the exposed portion of the cable shielding, thence along any remaining exposed cable insulation and thence up over a portion of one of the frusto-conical surfaces of the adaptor.

3,932,934

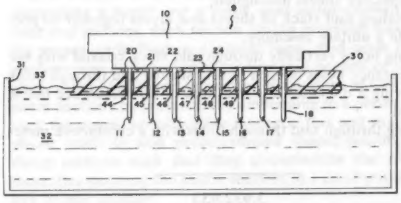
METHOD OF CONNECTING TERMINAL POSTS OF A CONNECTOR TO A CIRCUIT BOARD

James Edward Lynch, Harrisburg, and David Francis Fussleman, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 16, 1974, Ser. No. 506,153

Int. Cl.² H01R 43/00

U.S. Cl. 29—628 **6 Claims**



1. A method of securing the terminal posts of a connector having a housing and at least two rows of terminal posts into holes prepared therefor in a circuit board substrate and comprising the steps of:

inverting said connector with the terminal posts pointed upwardly;

slipping a solder element around selected ones of said terminal posts;

inserting a slip of resilient material between said rows of terminal posts;

said slip of material having a width sufficient to span the distance between said rows of terminal posts and to press against the inner surfaces of said terminal posts to lock said solder elements on said terminal posts between said slip of material and said connector housing;

inserting said terminal posts at least part way into said holes prepared therefor in said circuit board substrate;

extracting said slip of material from between said rows of terminal posts;

melting said solder elements while said terminal posts are pointed downwardly.

3,932,935

METHOD FOR MANUFACTURING A DUCTILE SILVER METALLIC OXIDE SEMI-PRODUCT

Ulf O. Harmsen, Pforzheim, and Wolfgang S. Pottken, Keltern, both of Germany, assignors to Dr. Eugene Durrwachter DODUCO, Pforzheim, Germany

Filed Feb. 14, 1974, Ser. No. 442,683

Claims priority, application Germany, Mar. 3, 1973, 2310784

Int. Cl.² H01R 9/00

U.S. Cl. 29—630 C **9 Claims**

1. A method for producing a ductile silver metallic oxide semi-finished product comprising:

a. selecting plates of a particular silver-metallic oxide material from a class consisting of internally oxidized and powder metallurgically produced material;

b. stacking said plates;

c. aligning said plates in a predetermined relationship for subsequent extrusion;

d. securing said alignment; and

e. extruding said plates under conditions of elevated temperature and pressure.

3,932,936

METHOD OF MANUFACTURING A DUCTILE SILVER METALLIC OXIDE SEMI-FINISHED PRODUCT CONTACTS

Ulf O. Harmsen, Pforzheim; Wolfgang Pottken, Keltern, and Egon Oertel, Pforzheim, all of Germany, assignors to Dr. Eugene Durrwachter DODUCO, Pforzheim, Germany

Continuation-in-part of Ser. No. 442,683, Feb. 14, 1974. This application July 12, 1974, Ser. No. 487,870

Claims priority, application Germany, July 21, 1973, 2337197

Int. Cl.² H01R 9/00

U.S. Cl. 29—630 C **7 Claims**

1. A method for producing a ductile silver metallic oxide semi-finished product comprising:

a. selecting rods from at least one member of a class consisting of silver metallic oxide, silver metal and silver metalloid rods;

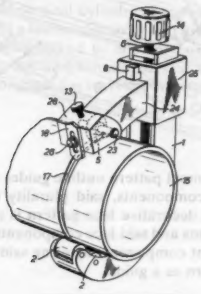
b. aligning a plurality of rods in an axial mode;
c. bundling said rods;
d. extruding said rods under conditions of elevated temperature and pressure.

3,932,937

TOOL FOR CUTTING AND GRADUATING OF PLASTIC TUBES

Gunnar Bastiansen, Rosendalsvn. 45, Oslo, Norway

Filed Mar. 21, 1975, Ser. No. 560,739
Claims priority, application Norway, Mar. 26, 1974, 1077/74
Int. Cl.² B23D *21/08*, *21/10*; B26D *3/16*
U.S. Cl. 30—102 4 Claims



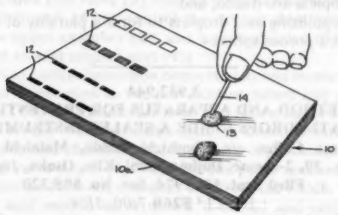
1. A tool for cutting and graduating plastic tubes, comprising:
a support member including an arcuate section;
a guide bracket supported by and projecting from said support member at a location spaced from said arcuate section;
primary cutting means, carried by said guide bracket, for cutting a tube disposed between said arcuate section of said support member and said guide bracket projecting from said support member;
a pivotable support bracket adjustably articulated to said guide bracket; and
auxiliary cutting and graduating means mounted on said support bracket in position to graduate the tube being cut by said primary cutting means.

3,932,938

PIGMENT PACKAGE FOR DENTAL FILLING MATERIALS

Leo Mackta, 444 Beach 132nd St., Belle Harbor, N.Y. 11694

Filed Dec. 11, 1972, Ser. No. 313,758
Int. Cl.² A61K *5/02*
U.S. Cl. 32—15 9 Claims



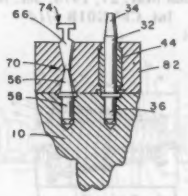
1. A sheet containing a plurality of discrete, premeasured quantities of pigments for producing natural colors in composite plastic dental filling materials, said pigments being adhered to said sheet by a hardened vehicle in which said pigments are dispersed, and said pigments in said vehicle being directly dispersible in said filling materials when brought into contact therewith.

3,932,939

PIN ARRANGEMENT FOR PROSTHODONTIC CASTS

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Aug. 8, 1973, Ser. No. 386,722
Int. Cl.² A61C *13/00*
U.S. Cl. 32—2 21 Claims



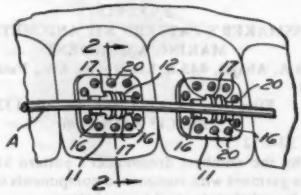
1. In a dental model of teeth, wherein segments thereof may be individually removed and replaced in original positions, a first cast forming an impression of at least one tooth on one surface thereof and having a substantially flat surface in opposed relation to said one surface; and second cast provided with a substantially flat surface for abutting against said flat surface of said first cast; at least two pins embedded in said first cast each having different length projections extending beyond said flat surface of said first cast, said second cast being provided with openings in the flat surface thereof configurated to receive at least portions of said pins when said flat surfaces are in abutment against one another, whereby the pin with the longer projection is a locating pin which initially engages and locates a corresponding opening in said second cast and the pin with the shorter projection is an alignment pin which is received in a corresponding opening to align and fix the position of said first cast relative to said second cast.

3,932,940

DENTAL APPLIANCE

Frank J. Andren, 6889 Anthony Lane, Parma Heights, Ohio 44130

Filed Dec. 6, 1971, Ser. No. 204,900
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 A 10 Claims



1. An orthodontic device removably attachable to a tooth for cooperative connection with orthodontic apparatus and for transmitting a force applied by the connected apparatus to the tooth, said device comprising
a thin plate of stiff, bendable sheet material having oppositely facing plain surfaces no larger than about the area of a tooth face, said bendable sheet material permitting said plate to be shaped generally to conform onen of said plain surfaces to a tooth surface,

a bracket fixedly mounted on the other of said plain surfaces of said plate for receiving and supporting and for attachment to cooperating force-applying orthodontic apparatus,

whereby suitable force is able to be effectively applied to a tooth through said device when said one of said plain surfaces of said plate is cemented to the tooth surface to which it generally conforms.

3,932,941

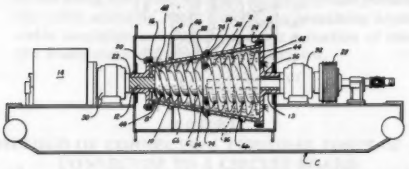
ROTATING MACHINE WEAR GAUGE MEANS

George S. Ormsby, P.O. Box 8774, Houston, Tex. 77009

Division of Ser. No. 223,210, Feb. 4, 1972, Pat. No. 3,849,893. This application Mar. 27, 1974, Ser. No. 455,401

Int. Cl.² G01B 5/14

U.S. Cl. 33—181 R **7 Claims**



1. In a scroll type conveyor for conveying solids, said conveyor having a helical blade, a housing at least partially encasing said blade and with respect to which said blade has relative rotation, and means defining a feed inlet to said housing and a solids outlet in said housing, said blade having wear characteristics which vary along its length and including a first wear portion and a second wear portion, said first portion having high wear characteristics relative to said second portion, said first portion being closer to said feed inlet than said second portion, and said second portion being closer to said solids outlet than said first portion, the combination of wear gauge means for measuring wear of said blade, said wear gauge means comprising a measuring device in the wall of said housing at a location along the length of said wall which is generally aligned with said first portion of said blade, said measuring device being operable cooperatively with said blade and said housing to measure the distance between a reference point radially and longitudinally fixed with respect to the axis of said blade and the radially outer edge of said first portion of said blade, and wherein the amount of wear of said first portion of said blade is so related to the amount of wear of said second portion of said blade that the amount of wear of said first portion is indicative of the amount of wear of said second portion.

3,932,942

DRESSMAKER'S PATTERN KIT AND METHOD OF MAKING A GARMENT

Kathleen A. Ahajot, 445 S. Los Robles Ave., Pasadena, Calif. 91101

Filed Jan. 24, 1974, Ser. No. 436,133

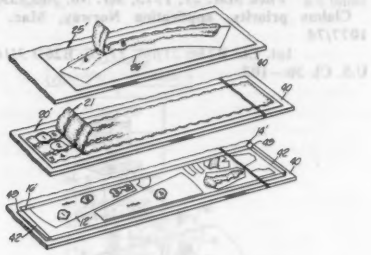
Int. Cl.² A41H 3/06

U.S. Cl. 33—12 **9 Claims**

1. A by the numbers dressmaker's pattern kit for use in making a garment with customized components of decorative lace appliqued thereto, said kit including:

a garment pattern having imprinted thereon outline guides for cutting garment yardage into individual components of a garment, certain of which outline guides have imprinted thereon irregularly contoured decorative images of at least one lace component of selected size and shape to be appliqued to the face of said garment components, said images each being imprinted with a distinctive identifying symbol;

a decorative lace pattern having imprinted thereon an image of an outstretched unfolded single layer of decorative lace yardage of a selected design and a plurality of closed loop guides superimposed on said lace pattern for subdividing said pattern into areas spaced crosswise and lengthwise thereof and for subdividing said lace yardage into a multiplicity of separate irregularly contoured decorative lace components, each of said closed loop guides being imprinted with an identifying symbol matching a respective symbol of said image of said garment pattern;



wherein said garment pattern outline guides are used to cut out garment components, said plurality of closed loop guides of said decorative lace pattern is used to cut out lace components and said lace components are appliqued to said garment components by using said images of said garment pattern as a guide.

3,932,943

METHOD OF PREPARATION OF LYOPHILIZED BIOLOGICAL PRODUCTS

Anglis R. Briggs, Newark, Del., and Thomas J. Maxwell, Philadelphia, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 340,196, March 12, 1973, which is a continuation-in-part of Ser. No. 177,834, Sept. 3, 1971, abandoned, and a continuation-in-part of Ser. No. 63,942, Aug. 14, 1970, Pat. No. 3,721,725. This application Aug. 16, 1974, Ser. No. 498,326

Int. Cl.² F26B 5/06

U.S. Cl. 34—5 **21 Claims**

1. A method of making a homogeneous lyophilized product of a substance containing at least one biologically active component which comprises:

a. forming a solution or colloidal suspension of said substance in a liquid which will freeze and which will also vaporize at a temperature which will not destroy the biological activity of said material;

b. spraying said solution or colloidal suspension, onto the surface of a moving bath of boiling fluorocarbon refrigerant having a temperature of below about −20°C. from a sufficient height above the surface of the moving bath to allow droplet formation before the solution or suspension strikes the surface of the moving bath, whereby said droplets are frozen; and

c. lyophilizing said droplets to form a plurality of uniform sized porous spheres.

3,932,944

METHOD AND APPARATUS FOR PREVENTING WATERDROPS INSIDE A SEALED INSTRUMENT

Misumasa Chiba, c/o Choshichi Ishida, Mainichi Sangyo Bldg., 39, 2-chome, Dojima Kami, Kita, Osaka, Japan

Filed Sept. 12, 1974, Ser. No. 505,320

Int. Cl.² F26B 7/00, 5/04

U.S. Cl. 34—12 **2 Claims**

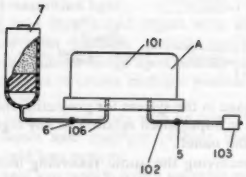
1. A method of preventing the formation of moisture in a watch having a detachable air-tight cover comprising the steps of placing the watch with its cover loosened in a sealed zone;

evacuating the air from said zone to cause a vacuum therein then feeding in dry air therein, whereby the dry air penetrates the watch and even when the zone is opened and the cover tightened, the dry air remains in the watch preventing the future foundation of moisture therein.

2. An apparatus for providing a protective dry air in a watch to prevent the formation of moisture in the watch comprising in combination:

a. a box-like housing having a deep lower chamber with a top and bottom defined therein, an elongated shallow recess upper chamber (**2**) with an upper peripheral abutment (**8**) formed of packing material around said recess upper chamber, a transparent plate (**9**) resting on said packing material covering said recess and sealed by said packing material, and first and second ports (**4, 3**) to said upper chamber;

b. a plurality of vertical cylindrical containers (**15**) including a first and a last container in said lower chamber, each container being linked to another container alternately towards the top and bottom of said chamber so as to define an elongated gas travel path in said lower chamber,



said containers each being filled with a silcia gel desiccator; an air filter (**17***a*) connected to said first container, an aperture (**22**) and a one-way valve (**20**) into said lower chamber connecting to said air filter (**17***a*) said last container being connected to said first port (**4**);

c. a threaded first valve (**6**) with a knob (**12**) connected to said first port (**4**) to control the dry air flow into said recess upper chamber (**2**), and a second valve (**5**) connected to said second port (**4**);

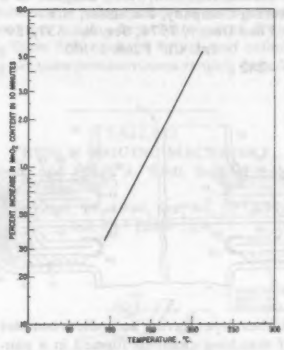
d. a suction outlet connection connected to said second port (**3**) for connection to vacuum exhaust means and pump means (**103**) to exhaust air from said recess upper chamber whereby when a watch with a loosened cover is placed in said chamber, said first valve (**6**) is closed, said second valve means (**5**) is opened and pump means (**103**) exhausts air from the chamber and from the watch, then, when said second valve means is closed and said first valve means (**6**) is opened, dry air from said lower chamber flows into the recess upper chamber into said watch remaining therein even when said chamber is opened to allow tightening of the watch cover.

3,932,945

DIRECT COOLING OF REDUCED MANGANESE ORE

Jay Y. Welsh, Catonsville, Md., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Nov. 11, 1974, Ser. No. 522,359
Int. Cl.² F26B *5/00*
U.S. Cl. 34—20 **10 Claims**



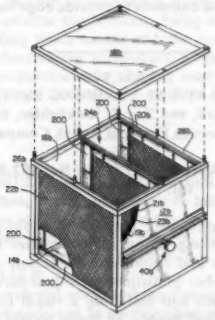
1. In a process for the cooling of hot reduced manganese ore, the improvement which comprises blowing air through a layer of hot manganous oxide ore at a velocity of at least 1 meter per second until the ore has reached the desired temperature.

3,932,946

MODULAR TOBACCO HANDLING AND CURING SYSTEM AND METHOD

William H. Johnson, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.

Continuation of Ser. No. 288,028, Sept. 11, 1972, abandoned. This application Dec. 18, 1973, Ser. No. 425,848
Int. Cl.² F26B *19/00*
U.S. Cl. 34—201 **10 Claims**



1. A curing or drying container for tobacco in intact or cut strip for use in a multiple container curing station, said container being of generally rectangular solid configuration comprising two pairs of opposed generally imperforate side walls forming gas flow directing means and the side walls of a curing station and a pair of opposed gas permeable perforate side walls for the passage of curing or drying gas therethrough, at least one immovable interior transverse perforate wall parallel to the opposed perforate walls, and means releasably securing one of the opposed imperforate walls to the others to thereby form an access opening for the container said two pairs of

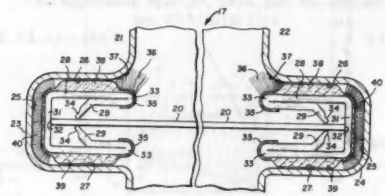
opposed imperforate side walls are heat insulating and wherein said pair of perforate side walls and said interior transverse wall are provided with peripheral baffles.

3,932,947

BEARING AND SEAL FOR TUMBLER BELT CLOTHES DRYER

Edward H. Smoot, Holcomb, N.Y., assignor to The Schlegel Manufacturing Company, Rochester, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,159
Int. Cl.² F26B 25/00
U.S. Cl. 34—242 **10 Claims**



1. In a clothes dryer having an endless tumbler belt driven in a pair of matching channels formed in a pair of opposed upright panels with said belt extending between said panels to provide a clothes drying chamber between said panels and inside said belt, a bearing and seal comprising:

a. a carrier extending all the way around each edge of said endless belt;

b. means for holding each of said carriers securely on said belt;

c. each of said carriers having a metallic element extending over said edge of said belt and disposed in said channels;

d. each of said carriers having a continuous pile strip disposed along the inside of said belt to engage inner edges of said channels to form a sealing barrier keeping lint and air from entering said channels;

e. each of said carriers having a wear-resistant, low-friction material engaging the sides of said channels to provide a running fit for said belt in said channels; and

f. each of said carriers having a wear-resistant, low-friction material arranged between said metallic element and the bottoms of said channels to provide edge bearings for said belt.

3,932,948

AUDIO-VISUAL LEARNING SYSTEM

Murray C. Goddard, and Ray S. Kicklighter, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,859
Int. Cl.² G09B 7/08
U.S. Cl. 35—9 A **6 Claims**

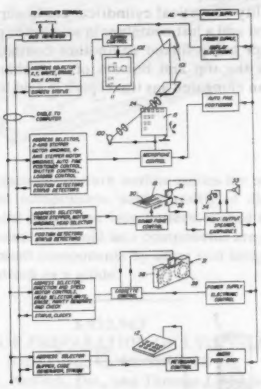
1. A student controlled, interacting audio-visual learning device for manifesting lesson subject matter in response to presented queries and responses, the lesson subject matter comprising a number of distinct records separately introducible into the device and including a visual record having a number of addressed images, an audio record having a number of addressed message tracks and a control record having recorded program and address data for selecting at least one of the images and of the message tracks as related to a presented query or response, the combination comprising:

a data center having storage means and memory means and in which programming information data and address data related to the lesson subject matter are introduced into the storage means and subsequently released in accordance with the presented query or response;

a display terminal comprising student--actuated input means, visual display means comprising a gaseous discharge panel connected to the input means and the date center and a transmission type screen axially aligned in spaced relation with the panel for jointly or severally displaying a legible manifestation on the panel and a selected one of the addressed images on the screen, and respective stations for receiving each of the records;

the input means being interconnected to the data center and to the visual display means and including means for converting alpha-numeric and graphic information into input data for acceptance by the data center and for reproducing the information on the panel as the legible manifestation;

the station receiving the visual record including a projection system and means responsive to released address data from the data center for locating a correspondingly addressed image in the system for projecting the image onto the screen in superposed relation to any legible manifestation on the panel;



the station receiving the audio recording including transducer means and means responsive to released address data from the data center for locating a correspondingly addressed message track relative to the transducer means and for moving the audio record to reporduce the message as an aural query or response related to at least one of the reproduced information and of the projected image on the visual display means; and

the station receiving the control record including transducer means interconnected to the storage means and memory means for reading and transmitting the recorded program and address data to the data center;

means responsive to some portion of the query or response presented via the input means for transferring from the storgae means to the memory means the address of at least one of the addressed images, the address of one of the addressed message tracks and program data for providing a legible manifestation on the panel related to the presented query or response; and

circuit means interconnecting each of the storage means, the memory means, the visual display means, the image locating means and the track locating means and responsive to a control signal generated by the input means, upon completion of the query or response, for jointly or severally transferring and subsequently releasing the program and address data related to the presented query or response from the storage means to the memory means, the released program data initiating the converting means to provide the legible manifestation of the query or response on the panel and the released address data initiating at least one of the locating means to position the addressed image related to the query or response in the projection system to provide a visual image on the screen that is superposed on any legible manifestation

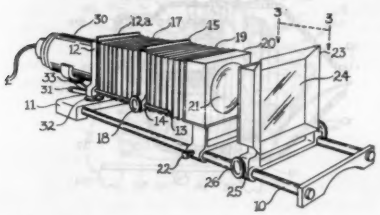
and the locating and moving means to position the addressed message track related to the query or response relative to the transducer to provide an audio presentation.

3,932,949

METHOD FOR DEMONSTRATING OPTICAL ABERRATION FORMATION

Hugh R. King, 1075 First Ave., New York, N.Y. 10022

Filed Feb. 20, 1974, Ser. No. 444,111
Int. Cl. G09b 23/22
U.S. Cl. 35—19 B 8 Claims



1. A method for the visual demonstration of the process of the formation of image aberrations and their causes as created by optical lens refraction, comprising the steps of:

a. illuminating a given object by means of an illuminator so that said object projects an intense image by either incident or transmitted light;

b. aligning said illuminated object with an opaque plate perforated with multiple pinhole apertures so as to project said intense image upon and through said pinhole apertures so as to create multiple pinhole images of said intense image;

c. aligning said opaque plate with an optical lens system so as to project said multiple pinhole images upon and through said lens system;

d. aligning said lens system with a movable means of directly observing the characteristics and behaviour of said pinhole images after they have passed through and been refracted by said lens system and at any given distance from said system.

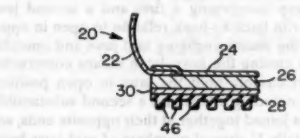
e. moving said movable means of observing the behaviour of said refracted pinhole images back and forth through the image plane of said lens system so as to visually demonstrate the processes which cause the formation of varying optical aberrations observed when said refracted pinhole images superimpose at said image plane.

3,932,950

FOOTWEAR WITH NON-SLIP TREAD

George J. Taber, Buffalo, N.Y., assignor to Tractioneers, Inc., Buffalo, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,656
Int. Cl.² A43B 23/28, 13/04
U.S. Cl. 36—59 R 3 Claims



1. An athletic shoe particularly suited for use on both artificial and natural turfs, resepectively, having

an insole,

a flexible backing secured to the underside of said insole,

a flexible outsole secured to said backing, and

a plurality of spaced, flexible protuberances carried by said outsole and providing a non-slip tread for the shoe,

said protuberances being uniformly spaced, flexible members integral with the outsole and projecting downwardly beyond the bottom surface of said outsole in rows spaced laterally and longitudinally of the outsole, and

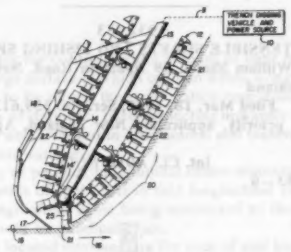
said protuberances being circular in cross section and having diameters ranging from 3/16 inch to ⅜ inch, heights ranging from 5/32 inch to ⅛ inch and center to center spacing between protuberances ranging from ¼ inch to ⅜ inch.

3,932,951

TRENCH DIGGING MACHINERY

Louie B. Scott, and Ellery A. Scott, both of P.O. Box 237, Lonoke, Ark. 72086

Filed Nov. 27, 1974, Ser. No. 527,833
Int. Cl.² E02F 5/06
U.S. Cl. 37—86 6 Claims



1. A machine for digging trenches by cyclically movable mechanism mounted on a movable vehicle with a power source for moving said vehicle and mechanism comprising, in combination, a set of spaced, successive extension plates fixed to and extending outwardly to different heights from the top surface of said mechanism; arcuate tooth means mounted on the outer end of each of said plates to dig a trench thereby; each of said arcuate tooth means being successively larger than a preceding tooth means and the combination of said tooth means functioning to produce a semi-circular trench bottom and to distribute the digging load substantially uniformly to the power source as the machine is moved along the trench.

3,932,952

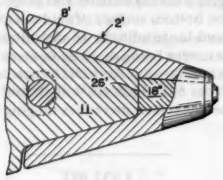
MULTI-MATERIAL RIPPER TIP

Eugene L. Helton, Peoria, and Walter B. Miller, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1973, Ser. No. 425,191
Int. Cl.² E02F 9/28
U.S. Cl. 37—142 R 1 Claim

1. A multi-material earthworking ripper tip for mounting upon a shank member of an earthworking device comprising; support means for mounting said tip upon said shank member, said support means including an internally formemd socket adapted to engage said shank member, separate tapered nose means attached to said support means, said nose means including a nose member having a first external portion, said first external portion being conical and having a taper diverging toward said support means, said nose member also having a uniformly tapered centrally disposed bore therein continuously diverging toward said support means, core means disposed within said central continuously diverging tapered bore and extending therein from a first end of said nose member

proximate said support means to a second distal end of said nose member, said core means being comprised of material which is harder and more wear resistant than that of said support means, said core means including a tapered hollow cone member mounted within said centrally disposed bore



and having an axially disposed second bore therein, said core means further including a core member being comprised of tungsten carbide material sintered in situ within said tapered centrally disposed bore, said core member being tapered and having an external surface diverging toward said support means.

3,932,953

EXTENSIBLE SHAFTS AND FISHING SPEARS

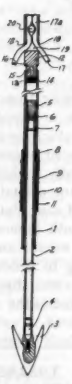
Richard William Sharp, 89 Ngamotu Road, New Plymouth, New Zealand

Filed Mar. 18, 1975, Ser. No. 559,613

Claims priority, application New Zealand, Apr. 1, 1974, 173873

Int. Cl.² A01K *81/04*

U.S. Cl. 43—6 **9 Claims**



7. A hand spear comprising an extensible shaft having a main tubular part with hand grip means, a cylindrical extension part telescopically located in and engaged with said main part so as to extend co-axially from one end thereof, the outer free end portion of the extension part being formed as or provided with a spear head, liquid seal means provided between the extension piece inner end and the main part, a butt end piece adapted to close the end of the main part remote from the end through which the extension part extends, said butt end piece incorporating liquid inlet means which can be exposed or opened by adjustment of the butt end piece relative to the main part to permit liquid from an external source to be drawn into the main part on extension of the extension piece, and seal means being provided between the main part and butt end piece so as to prevent escape of liquid from the main part when the butt end piece is adjusted to close the liquid inlet means and lock the extension piece against axial movement relative to the main part, and resilient thrust imparting means provided on the spear and arranged to add impetus to a spear thrust by a user.

3,932,954

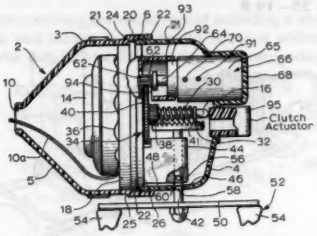
MOTORIZED SPINNING REEL

Alexander Hobart Wyroski, 4940 W. Oakdale Ave., Chicago, Ill. 60641

Filed Jan. 25, 1974, Ser. No. 436,616

Int. Cl. A01k *89/017, 87/06*

U.S. Cl. 43—21 **4 Claims**



1. In a fishing reel having a line-receiving spool element, a guide element for guiding a line onto the spool element, and means for selectively rotating at least one of said elements relative to the other for winding the line on the spool element comprising transmission means, and selectively actuable manual and motor-driven means operatively connected to said transmission means, and said reel comprising a housing, a motor holder moulded into said housing of yieldable plastic material, said transmission comprising a motor-driven driving gear and a meshing driven gear, and said material yielding upon imposition of a predetermined load causing said gears to wedge apart to release said driven gear and thereby the line.

3,932,955

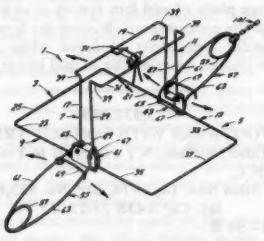
ANIMAL TRAP

Wilfrid Desrosiers, 6 Cournoyer St., Kapuskasing, Ontario, Canada

Filed Apr. 2, 1974, Ser. No. 457,377

Int. Cl.² A01M *23/30*

U.S. Cl. 43—81 **1 Claim**



1. An animal trap comprising a first and a second jaws connected together in back-to-back relation to open in opposite directions, spring means engaging said jaws and operable for simultaneously closing the jaws, latch means constructed and arranged to releasably hold the jaws in open position, each of said jaws including a first and a second substantially U-shaped members joined together at their opposite ends, and both first substantially U-shaped members of said jaws being fixedly and unitarily interconnected in end-to-end alignment and forming a fixed substantially flat support operatively underlying both said second substantially U-shaped members, a pair of plates rigidly secured to said flat support against the

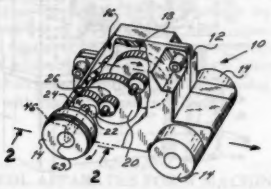
opposite sides thereof, said second U-shaped members pivoted to said plates at their ends, said plates forming abutments restraining pivoting of both second U-shaped members relative to both first U-shaped member.

3,932,956

TOY VEHICLE CLUTCH

Edmund Young, West, Hong Kong, assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,370
Int. Cl.² A63H *29/00*
U.S. Cl. 46—202 **12 Claims**



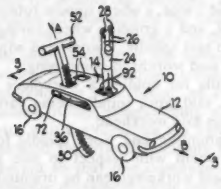
1. In a toy vehicle having a plurality of ground engageable wheels and drive means having a drive shaft operatively engaged with at least one of said wheels for driving the vehicle; a clutch formed in said at least one drive wheel for protecting said drive means; said clutch comprising a first clutch element fixed to the drive shaft for rotation therewith and a second clutch element freely rotatably mounted on said drive shaft; said second clutch element having a cavity formed therein which receives and peripherally surrounds said first clutch element; one of said first and second clutch elements having a plurality of radially extending gear-type teeth formed thereon and the other of said clutch elements having at least one enlarged detent formed thereon and dimensioned to fit between two adjacent gear teeth to provide a driving connection therebetween for transmitting power from the motor to the second clutch element to drive the wheel; said gear teeth being formed of a material having a predetermined flexibility relative to said detent whereby the teeth will flex over the detent so the clutch elements can rotate with respect to one another when the driven wheel is stopped while the drive means is in operation.

3,932,957

TOY VEHICLE

Howard J. Morrison, Deerfield, and Donald F. Nix, Hanover Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,498
Int. Cl.² A63H *17/00, 29/20*
U.S. Cl. 46—206 **11 Claims**



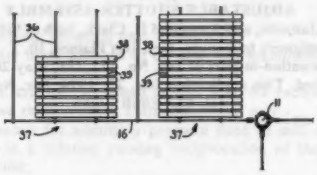
10. A gyroscopic toy vehicle, comprising:
a vehicle body;
a gyroscopic rotor fixed to an axial shaft journalled at its opposite ends on a gimballed rotor support means, said rotor support means being rotatably mounted on said vehicle body on an axis at an angle to said rotor axial shaft, and;
means for effecting rapid rotation of said gyroscopic rotor.

3,932,958

PLANT SHELTER

John J. Kistler, Jr.; William E. Chappell, both of Grand Haven, and Frank J. Brechting, Jr., Spring Lake, all of Mich., assignors to John Kistler & Associates, Inc., Grand Haven, Mich.

Filed Oct. 11, 1973, Ser. No. 405,702
Int. Cl.² A01G *13/00, 13/02;* E04B *7/14*
U.S. Cl. 47—26 **2 Claims**



1. A shelter for controlling the amount of light reaching a relatively large surface in which or upon which living plants or the like are to be raised, the combination comprising:
a plurality of stationary posts projecting upwardly from said surface and arranged in longitudinal and transverse rows along said surface;
a plurality of parallel, longitudinal cables connected to the upper ends of said posts in said longitudinal rows, each said longitudinal cable being connected to the posts of one of said longitudinal rows;
each post located intermediate the ends of said longitudinal rows having an upwardly opening slot formed in the upper end thereof, said slot extending across said post in the longitudinal direction of said longitudinal cable for accommodating an intermediate portion of said longitudinal cable therein;
a pair of clamp means fixed to the intermediate portion of said longitudinal cable and positioned directly adjacent the opposite sides of each slotted post, said clamp means being larger than the width of the slot for engaging the post to prevent longitudinal movement of said longitudinal cable relative to said intermediate post;
anchor cable means extending between the endmost posts of said longitudinal rows and said surface;
a plurality of parallel, transverse wires extending between and connected to pairs of said longitudinal cables, said transverse wires being uniformly spaced longitudinally of said longitudinal cables with the spacing between adjacent transverse wires being substantially less than the spacing between adjacent posts located in said longitudinal rows so that several of said transverse wires are positioned between said adjacent posts; and
cover means supported on said transverse wires and removable for permitting a selectively controlled amount of light to pass therethrough, said cover means including a plurality of elongated slatlike elements of substantially uniform length, said elements being removably supported on said transverse wires and positioned so that they extend perpendicularly between a pair of adjacent transverse wires;
said cover means also including wirelike flexible means interconnecting said slatlike elements at uniform spaced intervals and in parallel arrangement for permitting said slatlike elements and flexible means to be formed into a roll for storage purposes, said flexible means resulting in elongated narrow openings between adjacent slatlike elements whereby a controlled amount of light can pass

through said narrow openings, said slatlike elements having a length greater than the spacing between an adjacent pair of transverse wires so that a roll of said slatlike elements and flexible means can be unrolled upon and along a pair of adjacent transverse wires to provide a plant cover;

said cover means including a plurality of said rolls of slatlike elements and flexible means, said rolls being individually positionable on and freely removable from said transverse wires, whereby the number of rolls positioned on said transverse wires and the spacing between said rolls permits selective control over the amount of light permitted to reach the surface located below the shelter.

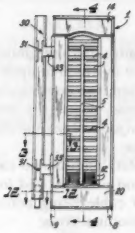
3,932,959
ADJUSTABLE SHUTTER ASSEMBLY

Eric G. Jansons, and Raymond D. Clark, both of Schaumburg, Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 471,231, May 20, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,298

Int. Cl.² E06B *7/086*

U.S. Cl. 49—75 **9 Claims**



1. An adjustable shutter assembly comprising:

a. a pair of opposed vertical frame members and top and bottom members securing said vertical members;

b. a plurality of spaced laterally extending louvers journaled at their ends and pivotally mounted in said frame members;

c. an actuator rod shiftably coupling said louvers;

d. vertical adjustment means comprising legs extending downwardly from said frame members, said legs being easily severable to adjust the length thereof;

e. a boot having a generally hollow U-shaped body including internal recesses receiving and holding said legs, said boot including gripper means at the upper end thereof; and

f. means on a lower portion of said shutter assembly to be grasped by said gripper means when said boot is in place upon said legs.

3,932,960
SINGLE SLIDE GRINDING MACHINE

Hugh T. Edgar, Charlestown, N.H., and John W. Lovely, Springfield, Vt., assignors to Bryant Grinder Corporation, Springfield, Vt.

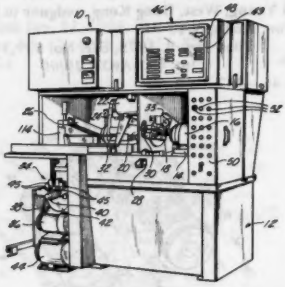
Filed Apr. 29, 1974, Ser. No. 464,917

Int. Cl.² B24B *53/04, 49/18, 47/20, 5/10*

U.S. Cl. 51—5 D **45 Claims**

1. A metal working machine comprising a base, first and second laterally spaced parallel slidebars rigidly mounted on the base, a wheelslide assembly mounted on the bars for longitudinal displacement thereover, said wheelslide assembly including a metal working wheelhead disposed substantially over the first bar, a workhead assembly rigidly mounted on the base in substantial longitudinal alignment with the wheelslide assembly, program means for producing controlled longitudinal displacement of the wheelslide assembly over the slidebars, and means independent of said program means for rotating the wheelslide assembly about said first slidebar thereby to laterally displace the wheelhead relative to the workhead assembly.

40. Apparatus as defined in claim 1 wherein said workhead assembly comprises a chuck, said wheelslide assembly com-



prises a grinder wheel spindle, the combination further comprising dresser means carried by said base, said program means being operatively connected to the dresser for bringing the dresser into operative contact with the grinder wheel in synchronism with the longitudinal displacement program of the wheelslide assembly.

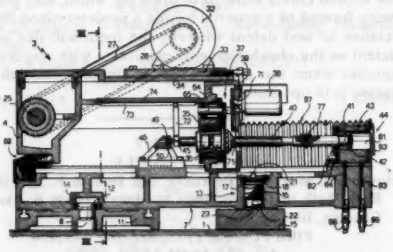
3,932,961
GRINDING MACHINE

Elio Pagella, and Carlo Guerci, both of Ivrea via Montefer-rando, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy

Filed Nov. 21, 1973, Ser. No. 417,904

Int. Cl.² B24B *49/18*

U.S. Cl. 51—165.8 **7 Claims**



1. In a grinding machine having a frame, a wheelhead mounted on said frame, a wheel spindle rotatably mounted on said wheelhead, and a grinding wheel having a grinding surface secured to said spindle, a workhead adjustably mounted on said frame, said workhead comprising:

a work spindle for holding a workpiece carried by said workhead, said work spindle being carried by bearings mounted on said workhead,

means for mounting said work spindle for rotatable and axial movement with respect to said grinding surface whereby said workpiece can be oriented with respect to said grinding surface and brought into contact with said grinding surface,

power means for rotating said work spindle,

a screw element having threadably mounted thereon a nut element, said nut element and said screw element being mounted for relatively rotatable movement with respect to one another to displace said elements axially with

respect to one another, said nut element having outer teeth and being rotatably mounted on said workhead and fixed against axial movement with respect to said workhead, said work spindle being coaxial with said nut element and passing through said nut element, said screw element comprising the outer surface of a first ring movable axially,

a second ring attached to said work spindle and rotatably and axially movable therewith, said second ring being engageable by said first ring to cause axial movement of said work spindle, and

means for rotating said screw element and said nut element with respect to one another comprising a step-by-step reversible electric motor carried by said workhead and having an output shaft means rotatable by a predetermined number of electric pulses, said output shaft means directly rotatably engaging said outer teeth of said nut element whereby rotation of said nut element by said output shaft means results in axial movement of said work spindle with respect to said workhead.

3,932,962

CONTROL APPARATUS FOR A MACHINE FOR GRINDING THE EDGES OF A WORKPIECE

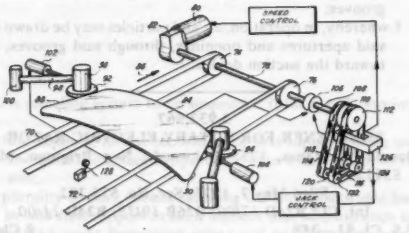
Julien Devillers, Livry Gargan, France, assignor to International Trading Company, France

Filed July 1, 1974, Ser. No. 484,572

Claims priority, application France, July 12, 1973, 73.25551

Int. Cl.² B24B *49/12*

U.S. Cl. 51—165.72 **12 Claims**



1. Control apparatus for a machine for grinding the edges of a workpiece by means of at least one rotary grinder during the displacement of the workpiece, which control apparatus is operable to impose a programme of speeds on the displacement of the workpiece, the said machine comprising: an endless linear conveyor defining a path of displacement for the workpiece; a motor for driving the conveyor; and at least one rotary grinder placed on one side of the conveyor so as to come into contact with one of the edges of the workpiece in the course of the displacement of the workpiece; the said apparatus comprising: a programming element having zones of varying transparency or reflectance; an emitter unit for emitting light beams to the programming element and an associated receptor unit for receiving the light beams which have been transmitted or reflected; means for turning the programming element so that one complete rotation corresponds to one complete movement along the path; an electric circuit connected to the receptor unit and to the motor of the conveyor for controlling the speed of rotation of the motor as a function of the intensity of the signal provided by the receptor unit so that the speed of displacement of the workpiece varies during the movement along the path according to the programme defined by the zones of the programming element.

3,932,963

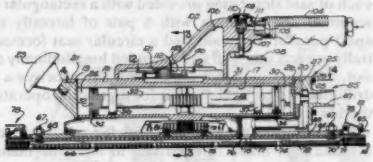
STRAIGHT LINE ABRADING TOOL

Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107

Filed Aug. 19, 1974, Ser. No. 498,534

Int. Cl.² B23D *67/00*

U.S. Cl. 51—170 TL **25 Claims**



1. A portable abrading tool, comprising:

a cylinder body adapted to be held and manipulated by a user;

a piston structure mounted in said body for reciprocation relative thereto along a predetermined axis;

valve means for admitting pressure fluid to said cylinder body in a relation causing reciprocation of the piston structure;

two racks carried by said piston structure for reciprocation therewith along said axis, said two racks both facing transversely of said axis but facing in two essentially opposite transverse directions respectively;

two gear units mounted to said body for rotation relative thereto and having gear teeth meshing with said two oppositely facing racks respectively in a relation transmitting to said body through said gear units transverse forces exerted thereagainst by said racks in said two opposite directions;

a shoe mounted for reciprocation relative to said body and parallel to said axis to abrade a work surface; and

means driven by at least one of said gear units for reciprocating said shoe relative to said body but oppositely from said piston structure.

3,932,964

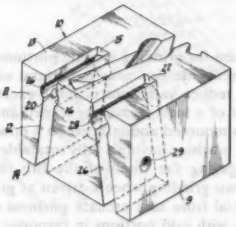
MULTI-ANGLE GRINDING FIXTURE

James B. Simms, Taylor, Mich., assignor to James B. Simms, Taylor, Mich.

Filed Dec. 13, 1971, Ser. No. 207,361

Int. Cl.² B24B *3/24*

U.S. Cl. 51—220 **1 Claim**



1. A multi-angle grinding fixture for holding a spade drill blade in a number of positions for grinding operations thereon, comprising:

a. a body member shaped as a block and having parallel side faces, parallel top and bottom faces, and parallel front and rear faces;

b. said body member being provided with at least four inwardly extended slots for holding a spade drill blade in four different positions for grinding the primary side clearance surfaces, the secondary side clearance surfaces,

the cutting lip angles, and the radii of the cutting edge lips of the blade;

c. each of said slots being angularly disposed relative to a particular block face to hold a spade drill blade at a predetermined angle when the block is seated on said particular block face to allow a particular cutting surface on the blade to be ground by a surface grinder;

d. each of said slots being provided with a rectangular cross-sectional configuration with a pair of laterally spaced apart parallel side walls and a circular seat formed centrally in each side wall and extended longitudinally of said slot, whereby each slot mates with and receives a spade drill blade to be held therein for a grinding operation on the blade; and,

e. means adjacent each of said slots for releasably locking a spade drill blade in each slot to hold the blade in a predetermined position for the grinding of a particular cutting surface when the body member is disposed with a particular one of said block faces downwardly.

3,932,965

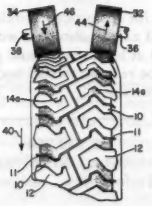
METHOD FOR TIRE TREAD FINISHING

Crandall R. Kline, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1975, Ser. No. 561,137

Int. Cl.² B64B *1/00*

U.S. Cl. 51—281 **4 Claims**



1. In a process for grinding arcuate portions of the tread of an inflated pneumatic tire near the lateral edge or edges of such tread to reduce variations in force exerted by such tire on the surface of a load measuring wheel, and in which process the tire is mounted and inflated on a power driven rotating chuck in a machine having a fully rotatable load measuring wheel for engaging the tread of the tire in loaded rolling contact and two grinding wheels driven at grinding speed to remove material from said arcuate portions engageable and disengageable with said portions in response to variations in load exerted on said wheel by said tire; the improvement comprising: driving each of said grinding wheels in a rotational sense opposite to the rotational sense of the other of said grinding wheels, such that one of said grinding wheels while engaged in material removing contact with the rotating tire cuts in an up-grinding mode and the other of said grinding wheels while engaged in material removing contact with the rotating tire cuts in a down grinding mode whereby the surface appearance of the tread of the tire is improved relative to the appearance thereof by rotating both said grinding wheels in a usual common directional sense.

3,932,966

ABRASIVE DISC

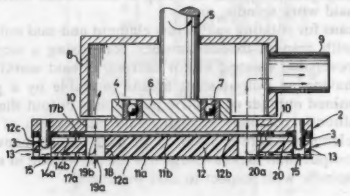
Leif E. Stern, Uppakra, Sweden, assignor to Bill Peter Philip Nederman, Helsingborg, Sweden

Filed Mar. 25, 1975, Ser. No. 561,896

Claims priority, application Sweden, Mar. 26, 1974, 74040247; Sept. 17, 1974, 74116674

Int. Cl.² B24B *55/02, 23/00*

U.S. Cl. 51—356 **11 Claims**



1. An abrasive disc which has an interior through which air and particles may flow and which is adapted to be detachably secured to a holder having pins projecting therefrom and a suction device associated therewith, the abrasive disc comprising:

a. a body of soft, resilient material having oppositely facing sides and an edge therebetween;

b. a first abrasive layer on one side of said body;

c. a first set of grooves in said body on at least said one side thereof, said abrasive layer extending across said grooves;

d. a first set of openings in said edge;

e. a first set of apertures in said first abrasive layer, said openings and said apertures being connected with said grooves;

f. whereby, in operation, air and particles may be drawn into said apertures and openings, through said grooves, and toward the suction device.

3,932,967

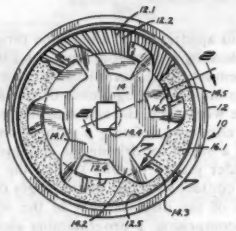
SHARPENER FOR ROTARY ELECTRIC RAZOR

Donald M. Hanes, 1755 Oakwoods, New Brighton, Minn. 55112

Filed May 7, 1975, Ser. No. 575,382

Int. Cl.² B24D *17/00*; **B26B** *19/38*; **B24D** *11/00*

U.S. Cl. 51—358 **8 Claims**



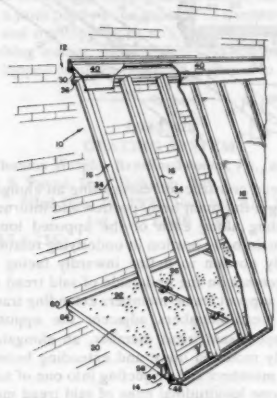
1. A sharpener for a rotary action electric razor with a comb having an annular, flat-bottomed, slotted trough and a blade having a plurality of spaced heads rotating in the trough, the sharpener comprising a flexible, normally flat annular disc receiveable in the trough flushly against its flat bottom and having a sharpening abrasive flat surface, the disc having a tab extending from an edge thereof and positionable at an angle to the plane of the disc and generally parallel to a side wall of the trough when the disc is received therein.

3,932,968

WALL PANELING SYSTEM

William C. Heirich, 2912 Wauhilah Drive, Muskogee, Okla. 74401

Filed Feb. 5, 1974, Ser. No. 439,754
Int. Cl.² E04C 1/39; E04D 1/06
U.S. Cl. 52—74 7 Claims



1. A paneling system to be suspended from a wall, comprising:

a first support, means securing said first support to the wall and permitting said support to rotate with respect to the wall;

a plurality of bars, means securing the top ends of said bars to said first support in such manner that said top ends are spaced apart from each other and extend continuously along said first support, each of said bars being provided with a top supporting wall and inwardly sloping side walls depending therefrom;

a second support, means securing the bottom ends of said bars to said second support in such manner that said bottom ends are spaced apart from each other and extend continuously along said second support;

a plurality of first panels secured to and connecting said first bars, adjacent of said first panels including one panel provided with a supporting wall abutting said supporting wall of the adjacent of said bars and an inwardly sloping side wall depending therefrom abutting one of said inwardly sloping side walls of the adjacent of said bars, and another panel provided with a supporting wall abutting said supporting wall of said one panel and inwardly sloping side walls depending therefrom abutting said inwardly sloping side wall of said one panel and the other of said inwardly sloping side walls of the adjacent of said bars;

a third support, means mounting said third support to said second support permitting said second and third supports to rotate with respect to each other;

a fourth support, means securing said fourth support to the wall; and

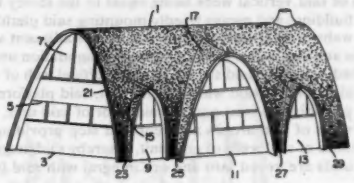
a plurality of second panels, the ends of each of said second panels being secured to said third and fourth supports, said second panels extending continuously along said third and fourth supports beneath said first panels.

3,932,969

FERROCEMENT STRUCTURES AND METHOD

Thad E. Matras, Box 307, R.D. No. 1, Highland, N.Y. 12528

Filed Aug. 19, 1974, Ser. No. 498,582
Int. Cl.² E04B 1/32
U.S. Cl. 52—86 10 Claims



1. An enclosure comprising:

a. a load-bearing framework defining the shape of said enclosure, at least a portion of said framework having a convex configuration;

b. at least one layer of moisture-impermeable flexible sheet-like material having an inside surface and an outside surface disposed over and supported by said framework, portions of said inside surface being in contact with said framework; and

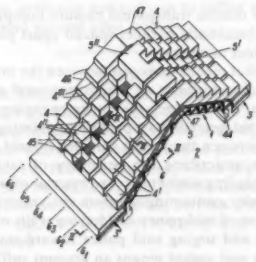
c. a layer of cured cement mortar having reinforcing means therein disposed over and in contact with the outside surface of said sheet-like material, said reinforcing means comprising at least two layers of wire mesh embedded in said cement.

3,932,970

BUILDING

John D. Winders, 26 Chantry Hurst, Epsom, Surrey, and Marian F. Grzesik, 26/28 Hillcroft Crescent, Ealing, London, W. 5, both of England

Continuation of Ser. No. 344,764, March 26, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,873
Claims priority, application United Kingdom, Mar. 27, 1972, 14296/72
Int. Cl.² E04H 1/00; E04B 1/342
U.S. Cl. 52—169 14 Claims



7. A monolithic multi-storey building over an area on which it is not desired or not possible to build directly, comprising a load bearing frame having an inverted substantially V-shaped profile and spanning said area without intermediate support, and a plurality of accommodation units, each of said units including a floor, a plurality of walls, and a roof, erected on said frame in a staggered formation towards the apex of said frame to form the storeys of said building, said frame consisting of a plurality of axially spaced arches, said arches having sloping upper and lower surfaces and vertical side walls between said upper and lower surfaces, pitched so that the dis-

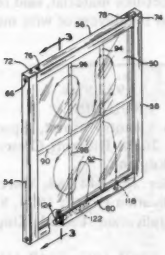
tance between said upper and lower surfaces of said arches, measured vertically, is equal to the height of each of said storeys of said building, and the weight of said building is supported substantially wholly by said arches, a plurality of horizontal platforms and vertical webs extending between each pair of said arches in alternating and continuous manner to form a series of staggered steps between said pair of arches on at least one side of the apices of said arches, the height of each of said vertical webs being equal to the storey height of said building, and means fixedly mounting said platforms and said webs on said side walls of said arches adjacent said platforms and said webs, each of said accommodation units being erected on one of said steps with said vertical web of said step providing one of said walls of said unit, said platform of said step providing at least part of said floor of said unit, and said side walls of said arches adjacent said step providing part of two more of said walls of said unit, whereby said accommodation units are keyed into and are integral with said frame.

3,932,971

WINDOW CONSTRUCTION

Ralph K. Day, 307 W. Harrison Ave., Maumee, Ohio 43537

Filed May 21, 1973, Ser. No. 361,989
Int. Cl.² E06B 7/12
U.S. Cl. 52—171 **3 Claims**



1. A hollow double transparent closure comprising:

a pair of substantially parallel spaced apart panes of transparent sheet material;

resilient gasket means disposed between the marginal edges of the facing surfaces of said panes, said gasket means having curved compressible faces engaging the adjacent faces of said spaced apart panes and defining an enclosed volume between the facing surfaces of said panes;

a frame circumscribing the periphery of said panes, said frame including elements of a material of a low thermal conductivity containing grooves for receiving the marginal edges of said panes and having walls of the grooves engaging and urging said panes toward one another to compress said gasket means an amount sufficient to produce an airtight sealing contact between the marginal edges of the facing surfaces of said panes and said gasket means; extending tongues on alternate ones of the elements of said frame fitted within the grooves of the adjacent other ones of the elements of said frame;

flushing gas directing means in the enclosed volume between said facing surfaces of said panes, said directing means being spaced across the planes of the respective panes to sub-divide the enclosed volume between the facing surfaces of said panes; and

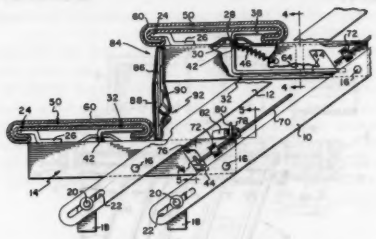
fastener means for interconnecting the grooved elements of said frame to form a rigid structure.

3,932,972

STAIR CONSTRUCTION

Rudolph J. Rossman, Box 16-B, Star Rte., Hillman, Mich. 49746

Filed Oct. 29, 1974, Ser. No. 518,709
Int. Cl.² E04F 11/00
U.S. Cl. 52—183 **9 Claims**



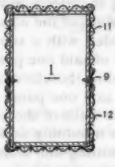
1. A stair tread construction comprising an elongate tread member having a flat main body portion and inturned flange portion extending along each of the opposed longitudinal edges of said main body portion in underlying relationship to said main body portion to define inwardly facing opposed longitudinal recesses on the underside of said tread member, a pair of tread support frame members extending transversely beneath said tread members adjacent the opposite ends thereof to support said tread member, an elongate tongue member fixedly mounted upon and extending between said support frame members and projecting into one of said recesses to anchor one longitudinal edge of said tread member to said support frame members, an elongate clamp member pivotally mounted on and extending between said support frame members, said clamp member having a longitudinal tongue portion projecting into the other of said recesses to anchor the other longitudinal edge of said tread member to said support frame members and to clamp said tread member against said tongue member, said clamp member being pivotally supported upon said support frame members for pivotal movement about an axis extending longitudinally of said tread member at a location intermediate the longitudinal edges of said main body portion, and a manually operable arm portion on said clamp member for pivoting said tongue portion of said clamp member between a generally horizontal tread member clamping position and an upwardly inclined tread member release position.

3,932,973

INSUBARS

Alvin Edward Moore, Manini Way, Bay St. Louis, Miss. 39520

Filed Nov. 18, 1974, Ser. No. 524,504
Int. Cl.² E04C 1/06
U.S. Cl. 52—216 **19 Claims**



1. A plural-sided construction member, including:

a plurality of end-joined sheathed-can rows, each of said rows comprising: a plurality of cans having their axes substantially arranged in a line; encompassing said cans, a pair of oppositely positioned, partially telescoped chan-

nels of apertured stiff material, having apertures adapted to receive and hold stucco, one of said channels having an opposite, spaced pair of elongated edge portions each of which is contiguous to and overlaps an elongated edge portion of the other of said channels; and means extending thru apertures in said contiguous, lapped edge portions for fastening said channels together and to the row of cans;

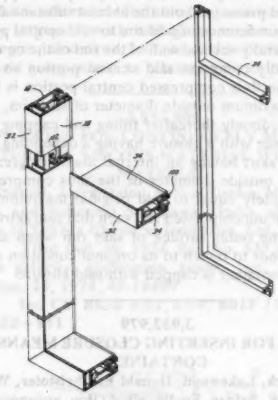
means fastening together each adjacent pair of sheathed-can rows at row ends in a strength-providing joint of said member, comprising: a row-end attachment flange on a said channel, extending beyond end cans of the row to which the channel is connected, and at said joint overlapping a joint portion of a channel of a second sheathed-can row and overlapping an end can of said second row; and attaching means, passing thru said row-end flange, thru said lapped joint portion, and fastened to said end can.

3,932,974

GLAZING SYSTEM

Gerald Thomas Wright, Bradfordwoods, Pa., assignor to Heimerich & Payne, Inc., Houston, Tex.

Filed Dec. 26, 1973, Ser. No. 428,346
Int. Cl.² E04B 2/88
U.S. Cl. 52—235 **12 Claims**



1. Curtain wall structure for use in the wall of a building, comprising

an elongate structural support member having an outside edge and an inside edge,

a longitudinally extending groove in the outside edge,

a longitudinally extending resilient sealing member engaged in said groove,

said sealing member having at least one laterally extending sealing lip facing toward said structural support member,

a wall panel sealingly engaged by said sealing lip,

a longitudinally extending compression member engaging said wall panel in such a way as to hold it in sealing engagement with said sealing lip, and

means for attaching said compression member to said structural support member to hold the compression member in position,

said compression member covering the structural member from the inside edge to the outside edge, and

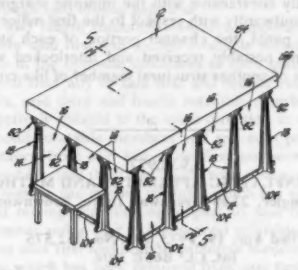
an inside cover plate concealing the inside edge, so that none of the structural member is visible.

3,932,975

BUILDING STRUCTURE AND COMPONENTS

John S. Hodge, 2350 Westridge Court, Ferndale, Mich. 48220

Continuation-in-part of Ser. No. 340,595, March 12, 1973, Pat. No. 3,861,102. This application Nov. 25, 1974, Ser. No. 527,137
Int. Cl.² E04B 2/72
U.S. Cl. 52—282 **24 Claims**



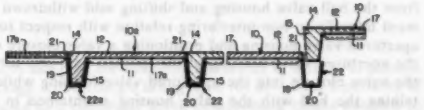
1. A building structure, comprising a plurality of generally vertically extending spaced column means, groove-like recess means formed in said column means and extending generally longitudinally thereof, said groove-like recess means having at least a major portion thereof inclined with respect to the vertical, and a plurality of wall panel means separate from said column means, said plurality of wall panel means being adapted to be respectively received between said spaced column means and at least partly received within said groove-like recess means formed in said column means to thereby define at least a segment of a wall assembly supported by said column means, said wall panel means comprising first and second oppositely disposed side edges, a first edge portion of said first side edge and a second edge portion of said second side edge also being inclined with respect to the vertical in a manner as to be complementary to the angle of said recess means, said first side edge further comprising a third edge portion, said second side edge further comprising a fourth edge portion, said third edge portion being disposed above said first edge portion and extending vertically upwardly as to define a vertical continuation of said first edge portion, and said fourth edge portion being disposed above said second edge portion and extending vertically upwardly as to define a vertical continuation of said second edge portion.

3,932,976

PREFABRICATED MODULAR STRUCTURAL PANELS

John F. Steel, P.O. Box 401, Palm Beach, Fla. 33480

Continuation-in-part of Ser. No. 767,890, Sept. 3, 1968, abandoned, which is a continuation-in-part of Ser. No. 652,386, June 14, 1967, abandoned, which is a continuation-in-part of Ser. No. 423,075, Jan. 4, 1965, abandoned. This application May 22, 1970, Ser. No. 39,610
Int. Cl.² E04B 2/10; E04C 1/10
U.S. Cl. 52—309 **3 Claims**



1. A self-supporting vertical wall section consisting essentially of a plurality of self-supporting modular structural members, each structural member including a rigid-foamed plastic body panel of substantial thickness, a marginal edge portion

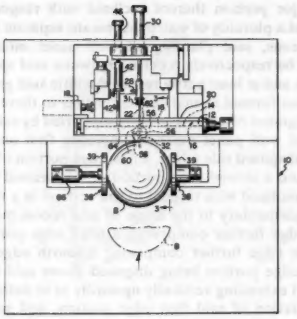
of the body panel defining an integral, vertically extending, roof-supporting beam portion which extends outwardly with respect to a first major surface of the body panel; a sheet member bonded to the body panel and beam portion in surface-to-surface contact to define the exterior surfaces of the structural member and to conform to the contour of the body panel and beam portion; marginal portions of the exterior sheet member being overlapped at an opposite marginal edge of the body panel to define an integral channel portion which is substantially coextensive with the opposite marginal edge and extends outwardly with respect to the first major surface of the body panel, the channel portion of each structural member being nestably received and interlocked with the beam portion of another structural member of like configuration.

3,932,977

BALL INFLATING APPARATUS AND METHOD

Lloyd H. Ringler, 2500 Greenway Drive, Brownwood, Tex. 76801

Filed Apr. 19, 1973, Ser. No. 352,575
Int. Cl.[2] B65B 3/04
U.S. Cl. 53—7 18 Claims



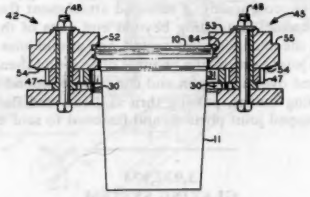
15. A method for inflating an expandable ball of type having an integral valve housing apertured for inward yielding reception of a closure adapted to retain inflating fluid in the ball comprising, impaling the apertured valve housing of the ball on a reciprocal inflation element and engaging the ball from the sides thereof for retaining it with said valve housing in predetermined position on the inflation element, inflating the ball to a predetermined expanded diameter size by means of the said inflation element, withdrawing the inflation element from the ball valve housing and shifting said withdrawn element laterally to non-interfering relation with respect to the apertured valve housing and positioning a valve closure over the apertured valve housing of the inflated ball, and forcing the valve closure into the apertured valve housing while retaining the ball with the valve housing maintained in said predetermined position by lateral gripping of the sides of the ball and thereby to seal the valve housing aperture so as to retain the inflating fluid interiorly of the inflated ball, and then terminating said gripping engagement of the ball from the sides thereof to permit movement of the ball away from the gripping means.

3,932,978

WORM-TYPE DISPENSER FOR RIMMED CONTAINERS

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 370,532, June 15, 1973, Pat. No. 3,849,970. This application Oct. 21, 1974, Ser. No. 516,479
Int. Cl.[2] B67B 3/00; B65B 7/28
U.S. Cl. 53—37 10 Claims



1. A process for filling and capping a paperboard container having a circular horizontal cross section and having an annular rolled rim projecting outwardly and downwardly from the upper end of said container, said rolled rim having an outer generally vertical wall with an original maximum outside diameter, said outer generally vertical wall having a central portion as determined by measuring vertically with the container in the normal position, which comprises applying inwardly directed pressure about the at least substantially entire horizontal circumference of said rim to said central portion of said outer generally vertical wall of the rim of the container to thereby inwardly compress said central portion so that the diameter of the thus compressed central portion is less than the original maximum outside diameter of said rim, and substantially immediately thereafter filling and capping the thus treated container with a closure having a depending cylindrical skirt, said skirt having an internal diameter greater than the maximum outside diameter of the thus compressed rim and approximately equal to said original maximum outside diameter of the uncompressed rim such that said skirt frictionally engages the outer surface of said rim when said compressed rim tends to return to its original condition after said thus treated container is capped with said closure.

3,932,979

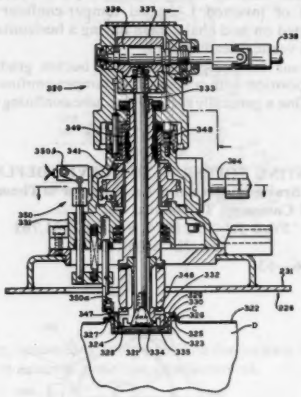
APPARATUS FOR INSERTING CLOSURE MEANS INTO A CONTAINER

Arthur J. Stock, Lakewood; Donald E. Christofer, Willowick, and Joseph E. Brinza, Euclid, all of Ohio, assignors to Stock Equipment Company, Chagrin Falls, Ohio

Division of Ser. No. 182,088, Sept. 20, 1971, Pat. No. 3,835,617. This application Oct. 25, 1973, Ser. No. 409,397
Int. Cl.[2] B65B 43/40, 7/28, 57/02
U.S. Cl. 53—76 25 Claims

1. Apparatus for placing a closure means having a helical thread at an opening of an object which opening has an axis and a coaxial matching helical thread at said opening adapted to have screwed onto it the thread of said closure means when said closure means is placed at said opening, which closure means has grasp means by which said closure means may be grasped at essentially any location about its axis, said apparatus comprising wrench means adapted to be actuated to positively engage said grasp means at essentially any location about its axis to firmly grasp said closure means and adapted to be actuated to positively disengage said wrench means from said grasp means to release said closure means; shaft means carrying said wrench means, said shaft means having a helical thread of the same pitch as said threads of said closure means and said opening; means) for supporting said shaft means and said wrench means for rotation and for movement of said wrench means toward and away from said opening, said supporting means including means having a helical thread match-

ing and engaging the thread of said shaft means, said helically threaded supporting means being immovable relative to said object while said wrench means is actuated to engage the grasp and unscrew said closure means from said opening and while said shaft means and wrench means are being rotated;



means for rotating said shaft means to cause said wrench means to move axially and to rotate; and means associated with said wrench means for actuating said wrench means to positively engage it with said grasp means of said closure means to grasp said closure means, and to positively disengage it from said grasp means to release said closure means.

3,932,980

APPARATUS FOR CONTINUOUSLY MAKING A MIXTURE OF VISCOUS MATERIAL WITH SOLID MATERIAL

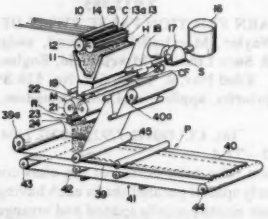
Keiti Mizutani; Akira Ogino, both of Osaka; Minoru Yamada, Hyogo, and Nobuyuki Nakagawa, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 30, 1974, Ser. No. 537,420

Claims priority, application Japan, Jan. 23, 1974, 49-10500; Jan. 23, 1974, 49-10499

Int. Cl.² B65B *9/02, 9/04;* **B01F** *15/02*

U.S. Cl. 53—111 **8 Claims**



1. An apparatus for continuously making a mixture of viscous material with solid material, which comprises;

first and second rotatable members supported in position for rotation in the opposite directions with respect to each other and spaced a predetermined distance from each other to define a mixing gap therebetween;

first supply means for supplying the viscous material and for generating zones of cascading flow of said viscous material, said zones of cascading flow of said viscous material being respectively downwardly oriented towards said first and second rotatable members, said cascading flow of said viscous material in said zones forming a viscous layer around said first and second rotatable members, said viscous layers on said first and second rotatable members adjoining to each other and subsequently entering said mixing gap as said first and second rotatable members are rotated in the opposite directions to each other;

second supply means for supplying the solid material onto said viscous layers, said solid material after having been supplied onto said viscous layers being dragged into said mixing gap during rotation of said first and second rotatable members to mix with said viscous material as it pass through said mixing gap; and

third and fourth rotatable members supported in position below said first and second rotatable members for rotation in the opposite directions to each other at a higher speed than any of said first and second rotatable members, said third and fourth rotatable members being respectively rotated in the same direction as said first and second rotatable members and spaced a predetermined distance from said respective first and second rotatable members, said third and fourth rotatable members acting to remove the viscous mixture, which has emerged from said mixing gap sticking in part to said first rotatable member and in part to said second rotatable member, off from said first and second rotatable members, said mixture which has been removed from said first and second rotatable members subsequently falling downwards by gravity and being then collected.

3,932,981

MACHINE FOR MULTIPLE ARTICLE PACKAGING

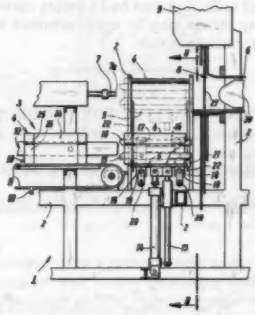
Walter Fillmann, and Werner Kalmbach, both of Stuttgart, Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart - Bad Cannstatt, Germany

Filed Oct. 7, 1974, Ser. No. 512,502

Claims priority, application Germany, July 19, 1974, 2434805

Int. Cl.² B65B *63/02*

U.S. Cl. 53—124 D **8 Claims**



1. A machine for wrapping a plurality of articles in a single package, comprising a lifting table for delivering a plurality of articles to a particular level, compressing means coupled to said lifting table and operative to move horizontally as a function of the vertical position of said lifting table whereby said articles are compressed, and wrapping means for horizontally receiving and wrapping said articles after delivery to said particular level.

3,932,982

APPARATUS FOR PLACING FOLDED BOXES OR THE LIKE IN SHIPPING CARTONS

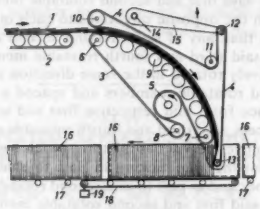
Hartmut Klapp, Kaarst, Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Nov. 28, 1973, Ser. No. 419,843

Claims priority, application Germany, Dec. 15, 1972, 2261416

Int. Cl.² B65B 5/10, 35/24

U.S. Cl. 53—244 3 Claims



1. An apparatus for filling a shipping carton with flat-folded boxes as put out in shingled array by a generally horizontal conveyor of a manufacturing or processing meachine, comprising a conveyor for supporting said carton and positioned below said manufacturing machine conveyor, a pair of cooperating curved conveyors extending from said manufacturing machine conveyor to said carton, a portion of one of said curved conveyors in operative position extending into said carton and bearing against one flat surface of boxes within said carton, whereby said boxes are transferred from horizontal shingled array to vertical shingled array and are successively discharged into said carton in vertical disposition, successive boxes discharged into said carton causing said carton to advance on its conveyor, and means for displacing said portion of said one curved conveyor between operative position in said carton and inoperative position above said carton, whereby when said carton is filled actuation of said displacing means to displace said portion into inoperative position permits said filled carton to be removed from below said curved conveyors and to be replaced by an empty carton, whereafter said displacing means may be again actuated to restore said portion to operative position.

3,932,983

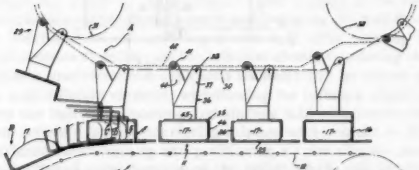
TAMPER AND CONFINER FOR PRODUCT BUCKET

Charles C. Hughes, Ludlow, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Sept. 26, 1974, Ser. No. 509,416

Int. Cl.² B65B 5/04, 63/02

U.S. Cl. 53—252 7 Claims



2. In a continuous motion cartoner comprising,

an endless carton transport conveyor,

a product bucket conveyor extending parallel to said transport conveyor and containing a series of product buckets,

means for feeding pouches into said buckets,

a barrel loader located adjacent said bucket conveyor to thrust said pouches from said buckets into cartons,

the improvement comprising,

said buckets being L-shaped and having a horizontal bottom wall and a vertical trailing wall,

an endless chain overlying said bucket conveyor,

a series of inverted L-shaped tamper-confiner elements mounted on said chain, each having a horizontal top wall and a vertical leading wall,

and means for bringing each said bucket gradually into juxtaposition with a respective tamper-confiner element to define a generally rectangular tube confining a pouch.

3,932,984

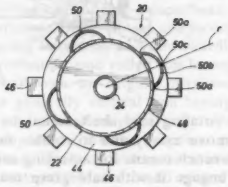
HARVESTING TOPPER WITH CURVED DEFLECTORS

Donald J. Brassette, Raceland, La., assignor to Thomson International Company, Thibodaux, La.

Filed July 25, 1974, Ser. No. 491,781

Int. Cl.² A01D 45/02

U.S. Cl. 56—63 6 Claims



1. Deflector apparatus for a harvesting topper, said deflector apparatus comprising:

an upstanding carrier having an upstanding axis and a surface facing laterally outwardly with respect to said axis;

a deflector on said carrier, and projecting laterally outwardly therefrom, said deflector having two side edges circumferentially spaced from each other on the laterally outwardly facing surface of said carrier and a curved outwardly convex deflector surface extending between said two side edges, said deflector surface facing generally laterally outwardly with respect to said laterally outwardly facing surface of said carrier; and

means connected to said carrier for mounting said deflecting apparatus for rotation about the axis of said carrier.

3,932,985

YARN FRICTION FALSE TWIST DEVICE

Geoffrey Naylor, Macclesfield, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Nov. 4, 1974, Ser. No. 520,891

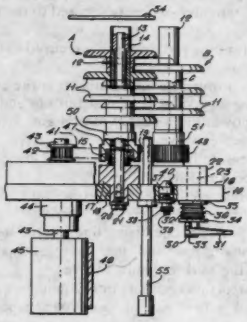
Claims priority, application United Kingdom, Nov. 3, 1973, 51135/73

Int. Cl.² D01H 7/92; D02G 1/04

U.S. Cl. 57—77.4 10 Claims

1. Friction false twist device of the class comprising three equiangularly spaced parallel shafts each having a set of rotary friction discs equally axially spaced and arranged so that discs of the sets overlap one another substantially when viewed axially and a strand passing through the centre of the device follows a zig-zag spiralling path as it contacts the rim of each disc in turn, wherein one of the sets of discs is a datum set and is mounted on a support member with its shaft projecting relative to a flat reference surface of the support member and with its shaft axis at a location which is fixed relative to the parallel axes of the shafts of the other two sets of discs, the latter shafts being carried on respective pivotal members each having a flat undersurface seated upon the flat reference surface of the support member or a surface co-planar therewith, and the shafts being mounted on the pivotal members with their axes equally spaced from fixed axes about which the

pivotal members are adjustable, the latter axes being equally spaced from each other and from the shaft axis of the datum



set of discs, and means being provided for locking the pivotal members in selected positions of adjustment.

3,932,986

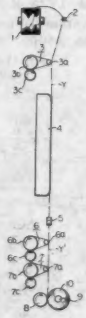
METHOD FOR MANUFACTURING A TEXTURED SYNTHETIC MULTIFILAMENT YARN HAVING ALTERNATELY GROUPED S AND Z TWISTS

Kenzo Kosaka; Shin Morioka; Kunio Shibata; Takashi Goto, all of Nagoya, and Eizi Takahashi, Toyoake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1974, Ser. No. 449,492

Int. Cl.² D02G 1/02, 3/34

U.S. Cl. 57—157 TS **5 Claims**



1. In a method for producing a synthetic multifilament textured yarn having compact and bulky portions comprising feeding a material multifilament yarn to a supply roller means, false-twisting said yarn fed from said supply roller means, delivering said false-twisted yarn by a delivery roller means, winding said false-twisted yarn delivered from said delivery roller means under an over-feed condition, an improvement comprising in combination, carrying out said false-twisting operation under a processing temperature within a range between a softening temperature and a melting temperature of the yarn, stretching said false-twisted yarn in a restricted condition below a limit of elastic deformation thereof, whereby the individual filaments in the compact portions are substantially separated from each other.

3,932,987

METHOD OF OPERATING A COMBUSTION PISTON ENGINE WITH EXTERNAL COMBUSTION

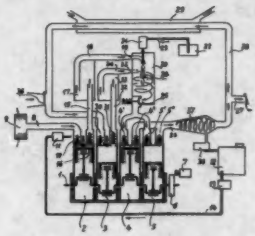
Friedrich Munzinger, Hohenrandstr. 46, 7 Stuttgart-Vaihingen, Germany

Continuation of Ser. No. 100,867, Dec. 23, 1970, abandoned. This application Nov. 21, 1974, Ser. No. 525,818

Claims priority, application Germany, Dec. 23, 1969, 1964427

Int. Cl.² F02G 1/02, 3/00

U.S. Cl. 60—39.05 **13 Claims**



1. A method of operating a combustion piston engine with external combustion at substantially constant pressure of an air-fuel mixture whose air content has been pre-compressed together with a liquid coolant, characterized by precompressing said air content and said coolant in one step to a pressure-temperature value at which the coolant is substantially saturated vapour.

3,932,988

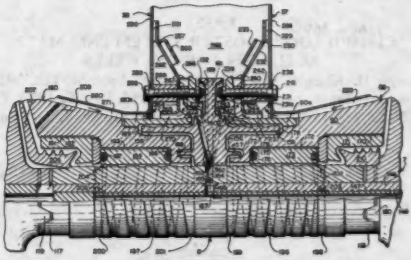
FUEL SLINGER COMBUSTOR

Albert H. Beaufrere, Private Road, Huntington, N.Y. 11743

Division of Ser. No. 300,774, Oct. 25, 1972, Pat. No. 3,818,696. This application June 24, 1974, Ser. No. 482,805

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.71 **4 Claims**



1. In a combustor with a rotary slinger as the fuel injector, the combination of wall means defining a combustion zone and a premix chamber in flow communication with said combustion zone; a rotary fuel slinger attached to shaft means to project atomized fuel in said premix chamber with a predetermined tangential swirl component; said premix chamber having an inlet means to supply inlet air to said premix chamber; air directing means in said inlet air means for directing said inlet air with a tangential swirl component opposite to said predetermined swirl component whereby the air is directed into and mixed with the projected fuel before the fuel reaches the combustion zone; and said wall means for the premix chamber comprising generally planar side walls and at least one conical wall surrounding said slinger so as to redirect the fuel into the path of the inlet air to the premix chamber; and said wall means further comprising additional air directional

means disposed to direct main primary combustion air into a heavy recirculation swirl of fuel/air mixtures in said combustion zone.

3,932,989

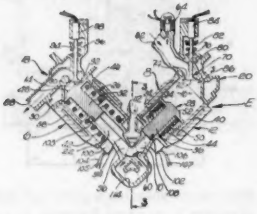
RESONANT GAS-EXPANSION ENGINE WITH HYDRAULIC ENERGY CONVERSION

Mihai C. Demetrescu, 17761 Palmento Way, Irvine, Calif. 92664

Division of Ser. No. 314,211, Dec. 11, 1972, Pat. No. 3,848,415. This application July 1, 1974, Ser. No. 484,739

Int. Cl.² F04B *17/00*

U.S. Cl. 60—327 **6 Claims**



1. A method of operating a gas expansion engine during intervals of idling and power-providing operation, having resiliently-mounted displacement-related pistons to provide motive power, comprising the steps of:

establishing a resonant frequency of oscillating motion for said pistons as the operating frequency for the engine;

sensing the amplitude of the oscillating motion of said pistons;

selectively actuating power strokes by each of said pistons during idling intervals of operation upon the amplitude of oscillating motion dropping below a predetermined level and otherwise during power-providing intervals of operation to provide motive power.

3,932,990

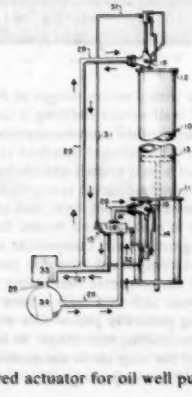
CLOSED LOOP BOOSTER SYSTEM PNEUMATIC ACTUATOR FOR OIL WELLS

Joseph H. Klaeger, 610 Chauncey, San Antonio, Tex. 78216

Continuation-in-part of Ser. No. 421,844, Dec. 5, 1973, Pat. No. 3,933,175. This application Aug. 15, 1974, Ser. No. 497,695

Int. Cl.² F15B *1/00, 13/042*

U.S. Cl. 60—369 **6 Claims**



1. An improved actuator for oil well pumps comprising:

a. an elongated cylinder,

b. a piston movably positioned in said cylinder dividing said cylinder into a top end and a bottom end,

c. a floating piston three-way spool valve having a low pressure port and a high pressure port and a cylinder port,

d. a top snifter valve operably secured to the top end of said cylinder,

e. a bottom snifter valve operably secured to the bottom end of said cylinder,

f. a bottom power line interconnecting the cylinder port of said three-way valve and said bottom snifter valve, said bottom power line adapted to flow gases to and from said bottom snifter valve,

g. a low pressure line leading from said low pressure port of said three-way valve,

h. a high pressure line leading from said high pressure port of said three-way valve,

i. a piston pressure equalizing line interconnecting the said low pressure line and the pumping cylinder top end through the said top snifter valve,

j. a top control line operably interconnecting said top snifter valve and a first end of said floating piston three-way spool valve,

k. a bottom control line operably interconnecting said bottom snifter valve and a second end of said floating piston three-way spool valve,

l. a booster means interconnecting said low pressure line and said high pressure line, said booster means receiving low pressure gases and compressing said gases and returning said gases to the high pressure line,

m. said top snifter valve and said bottom snifter valve in conjunction with said control lines and said floating piston three-way valve controlling the flow of high pressure gases to said cylinder and the flow of low pressure gases from said cylinder.

3,932,991

HYDROSTATIC TRANSMISSION CONTROL SYSTEM

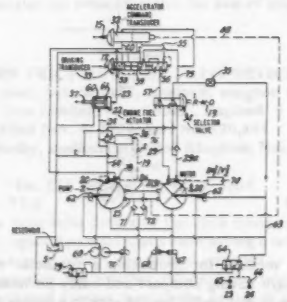
Robert Cecil Clerk, Edison House, Fullerton Road, Queensway Industrial Estate, Glenrothes, Fife, Scotland

Filed July 23, 1974, Ser. No. 490,921

Claims priority, application United Kingdom, July 23, 1973, 34908/73; July 18, 1974, 34908/74

Int. Cl.² F16H *39/46*

U.S. Cl. 60—431 **1 Claim**



1. In a vehicle drive system, in combination, a variable displacement type pump which pumps fluid at a pump delivery pressure, a fuel driven engine for driving said pump, a load-driving variable displacement type hydraulic motor driven by said fluid at said pump delivery pressure, and a control system including an accelerator for said engine, accelerator signal producing means for producing an accelerator signal as a function of accelerator command, pump speed signal producing means for producing a pump speed signal as a function of

pump speed, fuel supply means responsive to said accelerator signal to increase the supply of fuel to said engine as a function of said accelerator signal and responsive to said pump speed signal to decrease the supply of fuel to said engine as a function of said pump speed signal, means responsive to said accelerator signal for reducing the displacement of said pump as a function of said accelerator signal, motor displacement signal producing means responsive to said accelerator signal and to pump delivery pressure for producing a motor displacement signal as a function thereof, and means for increasing motor displacement as a function of said motor displacement signal.

3,932,992

PRESSURIZED FLUID SUPPLY POWER CONTROL MEANS

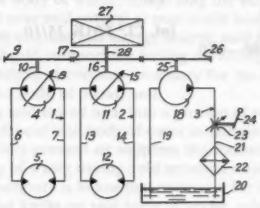
Louis E. Martin, Senlis, France, assignor to Poclain, Le Plessis Belleville, France

Filed Nov. 11, 1974, Ser. No. 522,841

Claims priority, application France, Nov. 21, 1973, 73.41493

Int. Cl.² F15B *18/00*

U.S. Cl. 60—431 **8 Claims**



1. A pressurized fluid supply apparatus comprising:

a closed circuit including a variable delivery pump having a drive shaft and no flow-limitation;

an open circuit including a pump having a delivery conduit and a drive shaft, a fluid reservoir and a fluid cooler;

an engine for driving said pumps and having an output shaft to which are coupled said drive shafts of said pumps, and

a flow-limiter arranged in the delivery conduit of said pump of said open circuit so as to divide said delivery conduit into two portions and comprising a restriction whose configuration is independent of the pressure of the fluid in the portion of said delivery conduit immediately upstream of said flow-limiter.

3,932,993

CONTROL APPARATUS FOR AN ADJUSTABLE HYDRAULIC MACHINE DRIVEN BY AN ADJUSTABLE DRIVING MOTOR

Josef Riedhammer, Ulm, Germany, assignor to Hydromatik GmbH, Ulm, Germany

Filed Dec. 11, 1974, Ser. No. 531,542

Claims priority, application Germany, Dec. 19, 1973, 2363335

Int. Cl.² F16D *31/00*; F16H *39/46*

U.S. Cl. 60—431 **3 Claims**

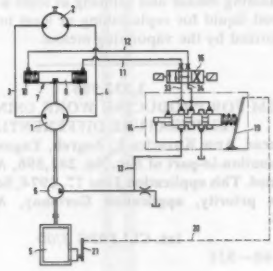
1. Control apparatus for an adjustable hydraulic machine driven by a driving motor which can be set to different desired speeds, comprising:

a fluid-operated adjustment motor having first and second control inlets for first and second fluid control inputs respectively, and having a machine adjustment control member displaceable in one direction under the action of the said first fluid control input, to effect adjustment of the hydraulic machine in one sense, and displaceable in the opposite direction under the action of the said second fluid control input to effect adjustment of the hydraulic machine in an opposite sense;

and a pressure control valve device comprising:

a valve housing having first and second fluid inlets, for connection to receive a fluid pressure input which provides the said first fluid control input and varies with the actual speed of the driving motor, a control outlet for connection to the said second control inlet to supply thereto the said second fluid control input, and a discharge outlet; portions of the housing defining a first control chamber, connected to the said first fluid inlet, a second control chamber, connected with the said control outlet, first internal passage, connected between the said second fluid inlet and the said control outlet, and a second internal passage connected between the said control outlet and the said discharge outlet,

a displaceable valve slide accommodated in the said housing for displacement therein between a first position, in which the slide blocks the said first internal passage but leaves the second internal passage open, a second position, in which the slide blocks the second internal passage



but leaves the first internal passage open, and intermediate positions in which the slide provides partial opening and closing of the first and second internal passages; respective portions of the slide defining first and second piston faces respectively located in the said first and second control chambers and each facing in a direction from the said first position to the said second position, whereby the slide is urged in the direction from its said second position to its said first position by fluid pressure in the said control chamber and is additionally urged in that direction, when the control slide is in its said second position, by fluid pressure in the said second control chamber,

and adjustable biasing means acting upon the said valve slide to apply thereto a force, selectively adjustable in dependence upon the desired speed of the said driving motor, urging the said valve slide from its said first position to its said second position; whereby a fall of the actual speed of the driving motor by more than a predetermined amount relative to a selected desired speed of the driving motor initiates compensatory adjustment of hydraulic machine by way of the said adjustment motor.

3,932,994

THERMAL ACTUATOR

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

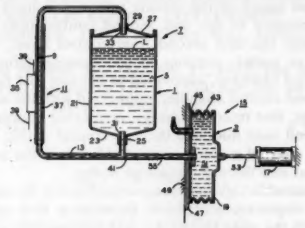
Filed Feb. 6, 1974, Ser. No. 439,894

Int. Cl.² F03G *7/06*

U.S. Cl. 60—531 **64 Claims**

1. A method of driving a driven one of a pair of means for containing a vaporizable liquid and communicating with each other in a thermal actuator comprising the setps of:

a. deliving the liquid from the other of the containing means to means exteriorly thereof for vaporizing the liquid;
b. vaporizing the liquid delivered to the vaporizing means upon the occurrence of a preselected condition; and

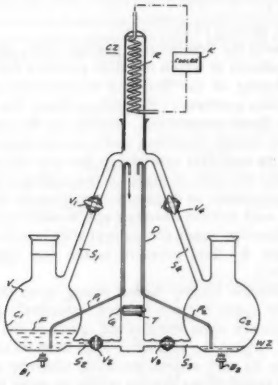


c. delivering the vapor created during the vaporizing step to the other containing means to act on the fluid therein and effect its displacement for driving the driven one of the containing means and utilizing at least a part of the displaced liquid for replenishing at least in part the liquid vaporized by the vaporizing means.

3,932,995
SYSTEM FOR PRODUCING WORK USING A SMALL TEMPERATURE DIFFERENTIAL

Milan Pecar, Ante Kovacica 1, Zagreb, Yugoslavia

Continuation-in-part of Ser. No. 241,596, April 6, 1972, abandoned. This application June 17, 1974, Ser. No. 480,096
Claims priority, application Germany, Apr. 17, 1971, 2118824
Int. Cl.² F03G *3/00*
U.S. Cl. 60—531 **3 Claims**

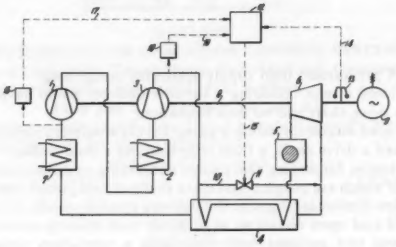


1. An apparatus for producing mechanical work using a pair of zones having a temperature differentials between them, said apparatus comprising:
a pair of substantially closed chambers at least one of which is in the high-temperature zone, a fluid having a boiling temperature lying between the temperatures of said zones being disposed in said chambers;
an upright duct at least partially in the low-temperature zone;
a tube extending between a lower region of each chamber and the upper end of said duct;
conduit means extending between each of said chambers and said duct for flow of liquid and gas therebetween, said chambers, duct, tubes, and conduit means constituting a closed system;
valve means in each of said conduit means for alternately blocking and unblocking same, whereby with the valve means of one of said chambers closed and the valve means of the other chamber open, said fluid having a boiling temperature lying between the temperatures of said zones will vaporize in said one chamber and be driven up the respective tube to flow down said duct and through the conduit means of the other chamber into this other chamber; and
turbine means in said duct between the ends thereof and operable by liquid flow through said duct for creating mechanical work.

3,932,996
PROCEDURE AND DEVICE SUITABLE FOR THE SPEED CONTROL OF A CLOSED GAS TURBINE PLANT CONTAINING A WORKING MEDIUM CYCLE

Karl Bammert; Reinhard Krapp, both of Hannover, and Günter Krey, Berenbostel, all of Germany, assignors to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

Filed Jan. 24, 1975, Ser. No. 544,014
Claims priority, application Germany, Jan. 24, 1974, 2403344
Int. Cl.² F01K *25/10*
U.S. Cl. 60—650 **11 Claims**



1. Procedure for the speed control of a closed cycle gas turbine plant containing a working medium, having at least one by-pass valve serving as an adjusting member for the working medium cycle, and using measuring transformers for converting the high pressure and the low pressure of the working medium cycle into a high pressure signal and a low pressure signal, respectively, and for converting the actual speed and the nominal speed into an actual speed signal and a nominal speed signal, respectively, said procedure comprising the steps of processing, in a first regulator part, only the difference signal between the actual speed signal and the nominal speed signal to provide a first output signal; processing, in a second regulator part, the high pressure signal and the low pressure signal to produce a second output signal; combining the first and second output signals to provide a summation signal; supplying the summation signal to a third regulator part as an input signal; and utilizing the output signal of the third regulator part to adjust the by-pass valve to control the working medium cycle.

3,932,997

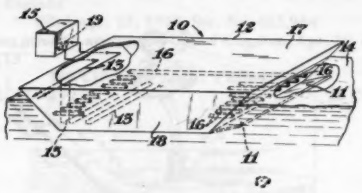
METHOD FOR SUPPRESSING THE FORMATION OF ICE IN NATURAL OR MAN-MADE BODIES OF WATER

John S. Best, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 311,491, Dec. 4, 1972, which is a continuation-in-part of Ser. No. 268,468, July 3, 1972, Pat. No. 3,768,264. This application Sept. 23, 1974, Ser. No. 508,368

Int. Cl.² E02B 3/00

U.S. Cl. 61—1 R 1 Claim



1. A method for suppressing the formation of ice in a natural or man-made body of water, comprising the steps of:

a. storing heat near said natural or man-made body of water from at least one thermal energy source, said heat being stored in a liquid composition having a freezing temperature substantially above that necessary for the formation of ice in said body of water; and

b. transferring said stored heat into a portion of water adjacent the surface of said body of water in sufficient amount to substantially prevent or suppress the formation of ice in said body of water during cold seasonal weather when the air temperature is below that necessary for the formation of an ice cover on said body of water, said transferring of stored heat being accomplished in conjunction with pumping and distributing of warm bottom water disposed adjacent the bottom of said body of water into said portion of water adjacent the surface.

3,932,998

MINE ROOF SUPPORT

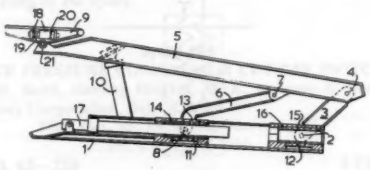
Walter Lubojatsky, Recklinghausen, and Wilhelm Wertelewski, Datteln, both of Germany, assignors to Becorit Grubenausbau GmbH, Recklinghausen, Germany

Filed Feb. 15, 1974, Ser. No. 442,833

Claims priority, application Germany, Feb. 27, 1973, 2309671

Int. Cl.² E21D 23/04

U.S. Cl. 61—45 D 10 Claims



1. A mine roof support comprising an elongated ground-engaging structure for placement with its longitudinal axis perpendicular to a mineral face, a roof-engaging structure overlying a forward portion of the ground-engaging structure, a shield structure extending between the rear of said ground-engaging structure and said roof-engaging structure longitudinally of and overlying said ground-engaging structure, first hinge means having a first hinge axis extending transversely to the longitudinal axis of said ground-engaging structure and serving hingedly to connect a rear portion of said shield structure to said ground-engaging structure, hydraulically extensible prop means extending between said shield structure and said ground-engaging structure and operable to pivot said shield structure relative to said ground-engaging structure about said first hinge means, second hinge means connecting a forward portion of said shield structure to said roof-engaging structure, said first hinge means including pivot means whereby said first hinge axis is pivotal about a second axis normal to said first hinge axis.

3,932,999

PILE DRIVING

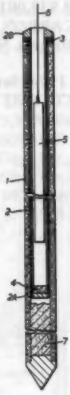
George Stewart Todd, Thames Ditton, England, assignor to Taylor Woodrow International Ltd., London, England

Filed Nov. 15, 1974, Ser. No. 524,276

Claims priority, application United Kingdom, Nov. 16, 1973, 53425/73

Int. Cl.² E02D 7/00

U.S. Cl. 61—53.5 6 Claims



1. A method driving hollow piles, comprising driving such a pile by applying blows to a first abutment of a hollow drive tube, said first abutment being remote from one end of the tube, said tube having a second abutment remote from said one end, said tube extending down the pile so that said first abutment is within the pile and spaced from the bottom of the pile so that the force of applied blows is transferred to the pile via said second abutment.

3,933,000

TUBULAR REGENERATOR FOR A CRYOGENIC REFRIGERATOR

Richard D. Doody, Culver City, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

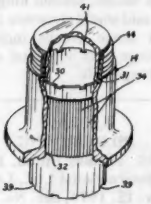
Filed Feb. 6, 1975, Ser. No. 547,664

Int. Cl.² F25B 9/00

U.S. Cl. 62—6 3 Claims

1. A hot cylinder for a cryogenic refrigerator having a hot displacer in the hot cylinder; a cold cylinder inclosing a cold displacer; a crankcase connected to the hot cylinder and the cold cylinder, a motor for moving the hot displacer and the cold displacer and a heater for said hot cylinder comprising: a cylindrical wall member adapted to be secured to said crankcase; an annular liner member positioned between the hot displacer and said wall member and spaced a predetermined distance from said wall member; a plurality of elongated tubular members in the space between the wall member and the liner member; said liner member including means for axially positioning the tubular members; means for providing a seal

between said hot displacer and said liner member; said liner member including means for providing a gas flow path between the crankcase through said tubular members into a hot volume adjacent the heater in the hot cylinder.

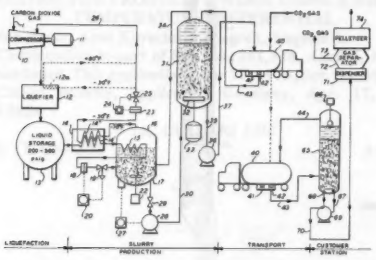


3,933,001

DISTRIBUTING A CARBON DIOXIDE SLURRY

Allen V. Muska, Berkeley Heights, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 23, 1974, Ser. No. 463,226
Int. Cl.² F25J *1/00*
U.S. Cl. 62—47 **1 Claim**



1. A system for transporting a solid-liquid carbon dioxide slurry including a vessel for retaining said slurry which during transport separates into solid carbon dioxide collected at the bottom of the vessel and a layer of liquid carbon dioxide thereabove, and vessel having a header disposed therein and a discharge pump having an outlet coupled to a slurry discharge conduit, the improvement comprising:

said discharge pump having a first inlet selectively coupled to said liquid carbon dioxide;

said header being substantially linear and having an inlet, a plurality of nozzles extending from said header along the length thereof and first and second end nozzles disposed in communication with either end of said header;

means for selectively coupling the outlet of said discharge pump to the inlet of said header;

a reslurry pump having an inlet selectively coupled to the bottom of said vessel and an outlet selectively coupled to said header inlet, said discharge pump having a second inlet selectively connected to the bottom of said vessel with said first end nozzle of said header juxtaposed with the inlet of said reslurry pump and said second end nozzle of said header juxtaposed with the second inlet of said discharge pump such that upon said discharge pump passing liquid CO_2 from the first inlet thereof to said header inlet, jets of liquid carbon dioxide emitted through said first and second header nozzles are effective to fluidize solid CO_2 collected in the inlet of said reslurry pump and in said second inlet of said discharge pump such that reslurried liquid-solid CO_2 is passed through said reslurry pump and said header nozzles into said vessel with the solid CO_2 collected at the bottom of said vessel thereby reslurried prior to removal of said slurry from said vessel through said discharge pump and said slurry discharge conduit.

3,933,002

SKATING RINK

Earle R. Vickery, 101 Merrick St., Worcester, Mass. 01609

Filed June 17, 1974, Ser. No. 479,818
Int. Cl.² F25D *1/00*; A63C *19/10*
U.S. Cl. 62—56 **6 Claims**

6. A method of forming a skating rink, comprising the steps of:

a. forming a flexible tube into the periphery of a closed geometric figure on a horizontal surface,

b. placing a material in the tube,

c. causing the material to fill the tube and form a rigid mass,

d. covering the closed figure with a water resistant sheet to form a liquid holding structure, and

e. placing water in the structure,

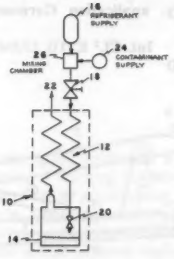
f. causing the water to freeze.

3,933,003

CRYOSTAT CONTROL

Arvel Dean Markum, San Juan Capistrano, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Division of Ser. No. 464,078, April 25, 1974, Pat. No. 3,885,939. This application Jan. 6, 1975, Ser. No. 538,651
Int. Cl.² F25B *47/00*
U.S. Cl. 62—85 **10 Claims**



1. A method of automatically controlling the flow of refrigerant in a cryostat comprising the steps of:

selecting a cooling cycle for the cryostat to be automatically controlled;

selecting and providing a refrigerant gas supply for the cryostat to meet the requirements of said selected cooling cycle;

selecting and providing a contaminant for the cryostat to meet the requirements of said selected cooling cycle, said contaminant having a solidification point higher than that of said refrigerant;

introducing said contaminant into said refrigerant supply; and

alternately and automatically solidifying and melting said contaminant in the cryostat to reduce the flow of said refrigerant through the cryostat.

3,933,004

REFRIGERATION CONTROL SYSTEMS

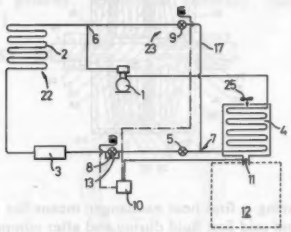
William Derrick Marshall Carter, Holme Drove, and Gerald Robin Scrine, Cambridge, both of England, assignors to Shipowners Refrigerated Cargo Research Association, London, England

Filed Apr. 25, 1974, Ser. No. 463,964

Claims priority, application United Kingdom, Apr. 26, 1973, 19935/73

Int. Cl.² F24D *11/02*; F25B *13/00*

U.S. Cl. 62—199 **15 Claims**



1. In a refrigeration system for a substantially enclosed space and including a compressor, a condenser, an evaporator, conduit means connecting said compressor, condenser and evaporator to form a cooling circuit, a hot gas by-pass conduit between the compressor and the evaporator and a thermostat which is sensitive to the heating or cooling requirement of the space, the improvement which comprises a first valve responsive to said thermostat provided in the hot gas by-pass conduit, a second valve responsive to said thermostat provided in the cooling circuit, the second valve having a permanently open by-pass, and means provided in the system for apportioning flow of gas between the cooling circuit and the by-pass conduit so that, during a temperature controlling phase of refrigeration, the gas flows both to the condenser and to the by-pass conduit and the apportioning of flow can cause either net heating or net cooling of the enclosed space, and in which the means apportioning the flow is so arranged that when first and second valves are open, there is net cooling of the space and that when said second valve is closed, there is net heating of the space.

3,933,005

HIGH PRESSURE COMPRESSOR CUT-OFF SWITCH

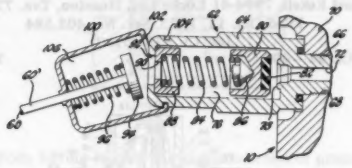
John H. Beltz, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1974, Ser. No. 514,295

Int. Cl.² F25B *1/00*

U.S. Cl. 62—228 **2 Claims**

1. A combination pressure relief valve and disconnect switch adapted for use with an air conditioning compressor which is activated by the energization of an electromagnetic clutch comprising: a valve housing enclosing an interior space and having a relief passage extending therefrom for connection to the outlet portion of the compressor; a valve seat formed around the end of the relief passage; valve means within said interior space normally engaging said valve seat to prevent fluid flow therebetween when the fluid pressure in the compressor outlet is below a predetefmined level and being movable away from said valve seat in response to said predetermined fluid pressure to discharge excess pressurized fluid into said interior space; a generally cup-shaped connector member having a hollow interior and an open end; said open end having turned-in edge means engaging said valve housing and sealingly enclosing said connector interior; said valve housing having a fluid relief passage connecting the interiors of said housing and said connector; a clutch terminal member



normally held in electrical contact with said housing by said connector member to close a clutch energization circuit whereby pressurization of said connector interior by opening of the valve causes separation of the inturned edge and said valve housing and opening of said clutch circuit by the resultant disconnection of said terminal member and said valve housing.

3,933,006

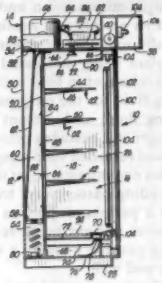
SUPERMARKET PRODUCE DISPLAY FIXTURE

Lewis E. South, Kansas City, Mo., assignor to The Weather Box Company, Kansas City, Mo.

Filed May 9, 1974, Ser. No. 468,232

Int. Cl.² F25B *19/00*

U.S. Cl. 62—231 **1 Claim**



1. An in-store article display fixture for bananas comprising:

an upright display case,

said case having a normally open-front display compartment defined by a back wall, a top wall, a bottom wall, opposed side walls and a curtain wall on each side of said open front;

a plurality of support members within said compartment for receiving the bananas to be displayed, said support members being in the form of arms extending from said back wall into said display compartment, said arms being adapted to receive and support hands of bananas in spaced, noncontacting relationship;

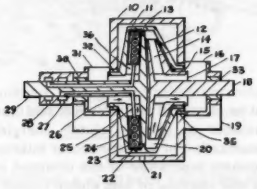
air circulating means operably associated with the case and disposed to selectively circulate air within said compartment and around the hands of bananas;

air cooling means operably associated with said case in a manner to selectively control the temperature of the air circulated within the compartment;

a pressure container containing a banana curing agent, said container being in communication with said display compartment; and

control means for providing time-controlled dispensing of said curing agent into said display compartment for circulation therewithin by said air circulating means.

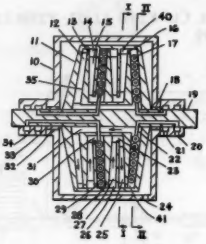
3,933,007
COMPRESSING CENTRIFUGE
Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042
Filed Oct. 11, 1973, Ser. No. 405,584
Int. Cl. F25b *3/00*
U.S. Cl. 62—401 **7 Claims**



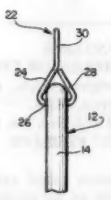
1. A working fluid compressor expander comprising:
a. a casing for supporting shafts;
b. shafts journalled in bearings in said casing for rotation;
c. a rotating first rotor mounted on a first rotor shaft so as to rotate in unison therewith, said rotor being of circular cross section in a radial plane and adapted for high speed rotation with its structural walls being thicker near the center than at its periphery; said rotor having an entry port for said working fluid near the center of said rotor and radially extending passageways having vanes therewithin for assuring that said working fluid therewithin rotates at the same rotational speed as said rotor for effecting centrifugal compression and effecting an elevated pressure at its periphery a cooling heat exchanger within said radially extending passageways in said first rotor with a coolant being circulated through passages within said heat exchanger in heat exchange relationship with said working fluid for the purpose of removing heat from said working fluid; said coolant being supplied to said heat exchanger via passages provided through said first rotor shaft, and returned via passages within said first rotor shaft; nozzles communicating at their entry end with said radially extending passageways and discharging said working fluid to a peripheral portion within said rotor; with said peripheral portion being separated from said radially extending passage ways by a wall with said nozzles mounted on said wall;
d. a rotating second rotor mounted on a second rotor shaft so as to rotate in unison therewith, said second rotor being of circular configuration in a radial plane and adapted for high speed rotation; said rotor having radially extending passageways communicating with said peripheral portion of said first rotor for receiving said working fluid; said radially extending passageways extending inwardly toward the center of said rotor, and having vanes therewithin to cause rotation of said second rotor on impingement by said working fluid against said vanes; and having an exit port near the center of said second rotor.

3,933,008
MULTISTAGE HEAT EXCHANGER
Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042
Filed Jan. 2, 1974, Ser. No. 429,496
Int. Cl.² F25B *3/00*
U.S. Cl. 62—401 **2 Claims**

1. A multistage heat exchanger comprising:
a. a means for supporting a shaft in bearings for rotation;
b. a shaft;
c. a rotor mounted on said shaft so as to rotate in unison therewith, said rotor having first radially outward extending passages connecting at their outward ends with first inward extending passages, said first inward extending passages connecting at their inward ends with second outward extending passages, said second outward extending passages connecting at their outward ends with second inward extending passages, said second inward extending passages connecting at their inward ends with third outward extending passages, said third outward extending passages connecting at their outward ends with third inward extending passages, said third inward extending passages connecting at their inward ends with the inward ends of said first outward extending passages for passing a first fluid, said second outward extending passage having a first heat exchanger means for removing heat from said first fluid during and after compression of said first fluid by said rotor, said third inward extending passages having second heat exchanger means for adding heat into said first fluid after said first fluid has been cooled by expansion within said rotor, said first heat exchanger means being supplied with a second fluid and circulated in heat exchange relationship with said first fluid, said second heat exchanger means being supplied with a third fluid and circulated in heat exchange relationship with said first fluid, said second fluid and said third fluid being passed into their respective heat exchangers via fluid passages within said rotor.



3,933,009
EARRING HAVING PIVOTED ONE-PIECE EARWIRE WITH MEANS FOR LIMITING LATERAL SHIFT
Thomas R. Ireland, Cumberland, R.I., assignor to Hallmark Findings Inc., Warwick, R.I.
Filed Aug. 9, 1974, Ser. No. 496,207
Int. Cl.² A44C *7/00*
U.S. Cl. 63—12 **2 Claims**



1. A pierced earring construction, comprising an earring member including a body portion that terminates in spaced free ends, a laterally extending opening formed in said body portion adjacent to one of the free ends thereof, and an earwire including a pivot portion formed as an integral part thereof that is mounted in said opening for pivotally locating said earwire on said body portion, a piercing portion of said earwire joined to the pivot portion thereof and bridging the space between said free ends for mounting the earring mem-

ber on an ear of a wearer, said pivot portion of said earwire including a pivot leg that extends through said opening and that is located in substantially perpendicular relation with respect to the piercing portion to which said pivot portion is joined, said pivot portion including means for coacting with adjacent surfaces of said body portion to prevent undue lateral shifting of said earwire relative to said body portion during pivoting, said means comprising other legs that are joined to said pivot leg and that cooperate therewith to define a triangular configuration, said other legs being located in close proximity to said surfaces of said body portion on opposite sides thereof.

3,933,010

PROFILE WIRE RING

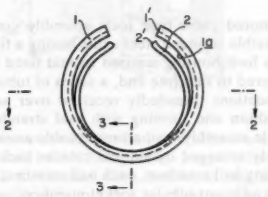
Josef Ulbrich, Sudetenstrasse 86-88, 8950 Kaufbeuran-Neugablonz, Germany

Filed May 28, 1974, Ser. No. 474,075

Claims priority, application Germany, June 1, 1973, 20584[U]

Int. Cl.² A44C 9/02

U.S. Cl. 63—15.6 **1 Claim**



1. A profile wire ring as a component for the production of finger rings, consisting of a first ring provided with an opening, said first ring being a profile ring and having a smoothly curved inner side provided with a groove extending along the whole length of said inner side, said groove being shaped in transverse section like a U with a flat bottom, and a second ring arranged in said groove, said second ring being resilient and having an opening radially inwardly adjacent to the opening of the first ring, the opening in the first ring serving for the subsequent insertion of a decoration mount, the second ring being arranged in a recessed manner in said groove at a location generally opposite to said openings, and means clamping said first and second rings in fixed relation with the bottom of said second ring conforming to the bottom of said groove, said means comprising two oppositely arranged lugs swaged from the material of the first ring in such a manner that neither the second ring nor the lugs extend radially inwardly from said smoothly curved inner side at the location of said lugs.

3,933,011

RING WITH INTERCHANGEABLE SETTING

Philip DiGilio, 843 E. 228th St., Bronx, N.Y. 10466, and John Manetta, 7402-19th Ave., Brooklyn, N.Y. 11218

Filed Mar. 27, 1974, Ser. No. 455,218

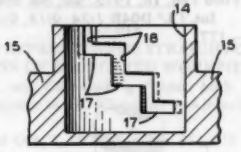
Int. Cl.² A44C 17/02

U.S. Cl. 63—29 R **1 Claim**

1. In an improved ring having an interchangeable setting, the improvement wherein:

said ring is provided with a base having a cylindrical bore, said setting having a cylindrical body adapted for mating engagement with said bore,

said bore having a surface provided with at least two programmed courses, the latter in spaced, balanced relationship, one to the other, around the surface of said bore, each of said programmed courses including an array of steps, each of said steps consisting of a horizontal slot followed in series by a communicating vertical slot on the surface of said bore,



said body having at least two separate arrays of protruding keys on said cylindrical surface, said key arrays being adapted to simultaneously traverse respective ones of said courses in the separation or engagement of said body relative to said base.

3,933,012

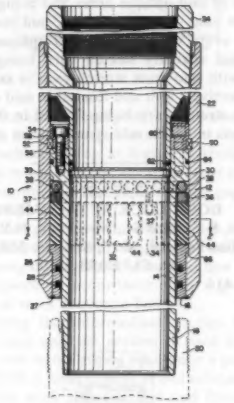
TORQUE ABSORBER FOR SUBMERGIBLE PUMPS

Lewis A. Ketchum, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed July 13, 1973, Ser. No. 378,947

Int. Cl.² F16D 3/06

U.S. Cl. 64—23 **13 Claims**



1. A torque absorber for a submergible pump or the like, comprising inner and outer cylindrical members relatively rotatable to a limited extent about a longitudinal axis, said outer member having an internal annular collar engaging the outer surface of said inner member, said inner member having an external annular collar engaging the inner surface of said outer member, said collars being spaced from each other, a thrust bearing between said inner and outer members in the space between said collars, said inner member having outwardly directed projections and said outer member having inwardly directed projections interdigitated with the projections of the inner member and spaced therefrom circumferentially of said inner and outer members, and torque absorbing elements located in the spaces between the adjacent projections of the inner and outer members, respectively.

3,933,013
CONTROL PANTY HOSE

Edward L. Cassidy, Sr., Burlington, N.C., assignor to Alamance Industries, Inc., Burlington, N.C.

Filed Feb. 18, 1975, Ser. No. 550,221
Int. Cl.² D04B 1/24, 9/18, 9/38
U.S. Cl. 66—177 7 Claims

1. A lower body garment, such as panty hose, including a control panty portion knit of stretch and spandex yarns to provide compressive force against the body of the wearer and comprising an attractive pattern of relatively opaque areas and open lace areas, said panty portion being knit with alternate courses of spandex yarn and intervening courses knit of main and auxiliary stretch yarns, said spandex yarn being knit in every wale of said opaque areas and being selectively knit and tucked in said open lace areas, said main stretch yarn being knit in every wale of both said opaque and open lace areas, and said auxiliary stretch yarn being knit in plated relationship with said main stretch yarn in said opaque areas and being selectively knit and floated in said open lace areas, said auxiliary stretch yarn being floated in the wales of said open lace areas in which said spandex yarn is tucked.

3,933,014
DOOR LOCK ATTACHMENT

Adolph Moses, 8 E. 83rd St., New York, N.Y. 10028

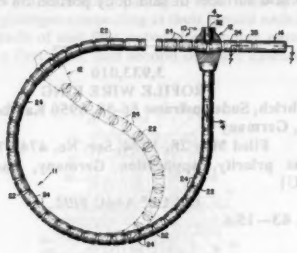
Filed Feb. 18, 1975, Ser. No. 550,269
Int. Cl.² E05B 13/00
U.S. Cl. 70—416 11 Claims

1. A one-hand operated, snap on and off, pocketable security locking attachment for a door lock having a thumb knob actuated bolt and a door knob hub, a single piece of material formed to embrace loosely the upper, lower, and lateral surfaces of the thumb knob, having shallow lips engaging the rear surfaces of the thumb knob but otherwise the embracing elements are open, both front and rear, and the thumb knob embracing elements extended to embrace the door knob hub.

3,933,015
ARMORED CABLE-TYPE LOCK ASSEMBLY WITH SPECIAL MEANS FOR RENDERING IT TAMPER-PROOF

Stanley C. Balicki, 2834 North Commerce St., Franklin Park, Ill. 60131

Filed June 20, 1974, Ser. No. 481,062
Int. Cl.² E05B 67/06
U.S. Cl. 70—49 4 Claims



1. An armored cable-type lock assembly comprising an elongated flexible stranded steel cable having a fixed end and a free end, a lock housing secured to said fixed end, an end member secured to said free end, a series of tubular sheathe-like armor sections threadedly received over said cable in bead-like fashion and forming with said stranded cable an armored cable assembly, said armored cable assembly including alternately arranged cylindrical tubular socket members and intervening ball members, each ball member, in combination with the adjacent tubular socket members, establishing a ball and socket joint between such adjacent socket members to allow limited flexing of the armored cable accompanied by corresponding angular displacement between adjacent socket members, said lock housing being provided with a transverse bore therein and adapted slidingly to receive therethrough axially aligned adjacent cylindrical socket members on the free end region of the cable in order to produce a closed variable size loop, one side wall portion of the bore being formed with a shallow internal concave relief area which is V-shaped from end to end, and releasable key-actuated locking means mounted in the lock housing and including a locking bolt disposed opposite to the relief area, extending at right angles to the bore, and slidable between a projected position wherein it extends into said bore and engages the opposed end edges of a pair of adjacent socket members in the vicinity of a ball and socket joint and displaces said adjacent socket members angularly and presses such joint into said relief area, said locking bolt being provided with a tapered end surface to the end that it makes linear contact with the adjacent end regions of the housing-enclosed socket members when it is fully projected and thus binds and kinks the armored cable within the bore and relief area, and a retracted position wherein the thus kinked region of the armored cable is relieved so that the armored cable may be withdrawn from the confines of the bore, thus releasing the cable and its associated armor sections for sliding movement through the bore.

3,933,016
DOOR LOCK MECHANISM

Roger J. Nolin, Monterey Park, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

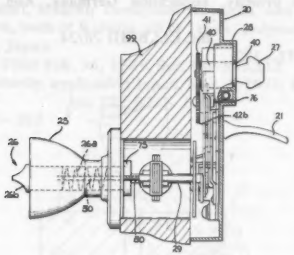
Filed Oct. 29, 1974, Ser. No. 518,277
Int. Cl.² E05C 1/12; E05B 17/00, 55/00
U.S. Cl. 70—149 26 Claims

1. A door lock comprising:

a. a lock mechanism, said lock mechanism having disposed therein, a reciprocating latch bolt, a latch driving means for engaging said latch bolt, and a rotatable lock cylinder assembly, said latch driving means effecting movement of

said latch bolt from extended to retracted positions, said lock cylinder assembly having at least a first, second and third gear means for actuating said latch driving means, said first gear means is coupled to said lock cylinder assembly and engages said second gear means, said second gear means engages said third gear means, and said third gear means is arranged and configured such that rotation of said lock cylinder assembly causes said third gear means to engage said latch driving means thereby effecting movement of said latch bolt;

b. an actuating member coupled to said latch driving means to selectively cause said latch driving means to effect movement of said latch bolt; and



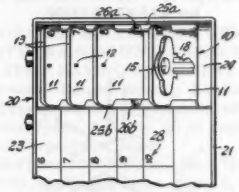
c. a selective control member, said selective control member and said latch driving means cooperatively coupled in said lock mechanism such that when said selective control member is in in a first position, said actuating member, when activated, engages said latch driving means and causes said latch bolt to move into said retracted position, and when said selective control member is in a second position, said latch driving means is disengaged from said actuating member, whereby said actuating member may be activated without causing said latch bolt to move into said retracted position.

3,933,017

KEY HOLDER AND RACK THEREFOR

William S. Shee, Woodbridge, Conn., assignor to Signal Office Products Co., Milford, Conn.

Filed Feb. 5, 1975, Ser. No. 547,358
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R **8 Claims**



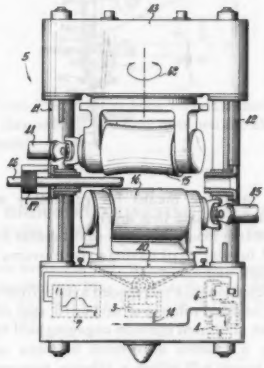
1. A key holder to which a key having an aperture is securable comprising a flat sheet of essentially rigid material having a periphery at least as large as the key, an elongate rectangular slot formed in the sheet adjacent one edge thereof and a fastener having a head larger than the key aperture and essentially parallel bifurcated legs with said legs being rectangular in cross-section and formed of bendable material, said slot being dimensioned to permit passage of the parallel legs therethrough but to resist relative rotation of the fastener with respect to the flat sheet whereby the fastener legs are adapted to pass through the key aperture and the slot from one side of the sheet to the other side and be bent flat against the other side to secure the key to the sheet while permitting the key to be rotated with respect to the sheet.

3,933,018

METHOD AND APPARATUS FOR STRAIGHTENING END SECTIONS OF ELONGATED WORKPIECES

Ralf Fangmeier, and Carl-Ludwig Pohler, both of Solingen, Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 3, 1974, Ser. No. 511,639
Claims priority, application Germany, Oct. 3, 1973, 2349693
Int. Cl.² B21D *3/04*
U.S. Cl. 72—7 **13 Claims**



1. A method for straightening sections of elongated workpieces, especially bars and tubes in a bending, forging and/or straightening machine having at least one straightening roll movable radially relative to the workpiece and at least a second roll for determining the straightening gap and force, comprising the steps of:

placing a section of a bar or tubing between the rolls;

moving one such roll into working position during the initial phase of straightening the forward section of the elongated workpiece in accordance with a predetermined mathematical work sequence function;

and straightening the intermediate section between the forward section and tail section of said workpiece by moving one roll into working position in a predetermined sequence which is independent of and substantially different from said work sequence for said forward and tail sections.

3,933,019

RIVETING DEVICE

Gary E. Underland, Clinton Falls Township, Steele County, and Thomas Novak, Woodville Township, Waseca County, both of Minn., assignors to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

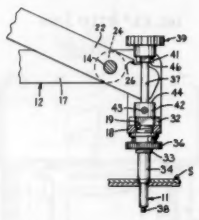
Filed Oct. 4, 1974, Ser. No. 512,082
Int. Cl.² B21J *15/34*
U.S. Cl. 72—114 **3 Claims**

1. A tool for installing an internally threaded tubular rivet, said tool comprising:

first and second relatively movable levers, said first lever having a portion with means defining a hole therein, said second lever having surface means thereon spaced above said hole and axially aligned therewith;

a tubular anvil having a portion received in said opening, said tubular anvil having enlarged head means defining a

radially outwardly extending shoulder thereon, said shoulder engaging said portion of said first lever encircling said hole to locate said anvil relative to said first lever and a threaded portion adjacent said shoulder, said threaded portion being received in said hole and nut means larger in diameter than said hole and having a thread thereon engaged with said threaded portion on said anvil, said nut means engaging said anvil on the opposite side of said portion of said first lever so that said portion of said first lever is clamped between said shoulder and said nut means;



releasable fastening means for releasably securing said tubular anvil to said first lever;

a rod extending axially through said tubular anvil, said rod and said tubular anvil having axial movement relative to each other; and

rotating means on said rod spaced axially from said anvil for rotating said rod relative to said anvil, said rotating means having an abutment thereon engaging said surface means whereby a relative movement between said first and second levers will effect a relative movement between said rod and said anvil.

3,933,020

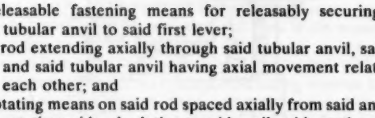
METHOD FOR STRETCH WRAPPING OF PANELS

Lavern G. Orr, Tustin, and Etric Lee Stone, Costa Mesa, both of Calif., assignors to TRE Corporation, Beverly Hills, Calif.

Filed July 18, 1974, Ser. No. 489,618

Int. Cl.² B21D *11/02*

U.S. Cl. 72—297 **3 Claims**



1. A method of stretch forming a honeycomb structure sandwich panel which comprises:

a. joining a pair of electrode tabs to opposing edges of said panel;

b. sealing the periphery of said panel;

c. gripping each of said electrode tabs between two groups of pairs of jaws, each of said pair of jaws being slideable between a pair of tapered blocks, whereby the clamping force between each pair of jaws will increase as tension is applied to said panel;

d. applying force to separate said groups of pairs of jaws, whereby tension will be created in said panel;

e. coupling a source of electrical current to said tapered blocks, all of said tapered blocks gripping one of said electrode tabs being coupled in parallel;

f. circulating an inert gas through the interior of said panel while said panel heated by said electrical current; and

g. wrapping said panel about a form block wherey said panel will assume the contours of said form block.

3,933,021

PROCESS OR METHOD OF PRODUCING A SMALL OPENING IN A RELATIVELY THICK METALLIC OR PIPE WALL

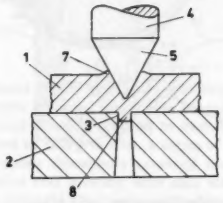
Burkhart Reese, Eltorf, and Lothar Schick, Windeck, Herchen, both of Germany, assignors to Boge GmbH, Eltorf,Sieg, Germany

Filed Aug. 28, 1974, Ser. No. 501,234

Claims priority, application Germany, Aug. 29, 1973, 2343432

Int. Cl.² B21D *28/24*

U.S. Cl. 72—327 **8 Claims**



1. In a method for producing a small opening in a relatively thick metallic wall, the steps comprising placing one face of the wall on a die formed with an opening corresponding substantially to the opening that is to be produced in the wall, positioning a tool formed with a generally conical tip adjacent the other face of the wall such that the conical tip is aligned with the opening in said die, and forcing said conical tip into said wall to a penetration depth approximately equal to the thickness of the wall at the point of penetration to force a portion of the wall metal into the die opening and shear it from the metallic wall.

3,933,022

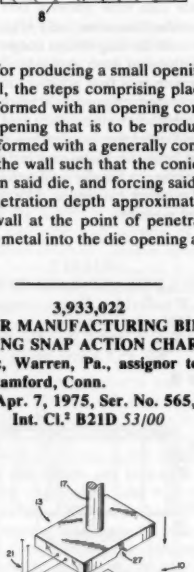
METHOD FOR MANUFACTURING BIMETALLIC MEMBERS HAVING SNAP ACTION CHARACTERISTICS

John Robert Peltz, Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 7, 1975, Ser. No. 565,753

Int. Cl.² B21D *53/00*

U.S. Cl. 72—342 **7 Claims**



1. An improved method for controlling the snap action characteristics of a thermally expansive bimetallic member during the manufacture of said bimetallic member wherein said snap action characteristics are defined by a predetermined temperature range having upper and lower limits, said

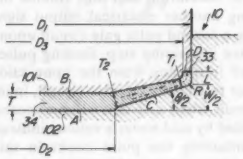
bimetallic member being provided said characteristics during a forming operation utilizing at least two opposing shaping members for engaging said bimetallic member for an established time period when said bimetallic member is positioned therebetween and imparting a predetermined shape thereto, said improvement comprising: heating said bimetallic member to an established temperature substantially above said upper limit of said predetermined temperature range for said snap action characteristics during said period of engagement by said opposing shaping members.

3,933,023

METHOD FOR MANUFACTURING A UNIT PIECE OF A V PULLEY

Hideo Tatsumi, Hitachi; Tomoyoshi Hirazuka, and Hisanobu Kanamaru, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1975, Ser. No. 553,212
Claims priority, application Japan, Mar. 1, 1974, 49-23356
Int. Cl.² B21K *1/42*
U.S. Cl. 72—359 **3 Claims**



1. A method for manufacturing a unit piece for a V pulley of the type in which at least a pair of unit pieces of the same configuration are assembled in back-to-back relation to each other into a single complete pulley, said unit piece having a central flat portion and a circumferential V groove forming portion continuous to the flat portion, characterized by the steps of preparing a forging stock of a disk form of which the outer diameter is equal to the outer diameter D_1 of the pulley unit piece and the thickness is equal to the thickness T of said flat portion of the pulley unit piece; and cold-forging said forging stock by means of at least a pair of upper and lower halves of a forging die for deforming an outer circumferential portion thereof so that the thickness of the portion is gradually reduced radially outwardly to form said circumferential V groove forming portion.

3,933,024

METHOD FOR COLD ROLLING OF A HIGH MAGNETIC FLUX DENSITY GRAIN-ORIENTED ELECTRICAL STEEL SHEET OR STRIP HAVING EXCELLENT PROPERTIES

Fumio Matsumoto; Katuro Kuroki; Kunihide Takashima; Toshihiko Takata; Hiromichi Yasumoto, all of Kitakyushu, and Kuniyasu Honda, Nakama, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed June 10, 1974, Ser. No. 478,100
Claims priority, application Japan, June 18, 1973, 48-68458
Int. Cl.² B21B *3/02*
U.S. Cl. 72—364 **1 Claim**

1. In a cold rolling method for producing a high magnetic flux density grain oriented electrical steel sheet or strip comprising the steps of hot rolling a silicon steel material containing 2.5 to 4.0% Si, not more than 0.085% carbon and 0.010 to 0.065% acid soluble Al, annealing the hot rolled steel sheet at a temperature between 950° and 1200°C and rapidly cooling the steel sheet to precipitate AlN, subjecting the steel sheet to a one-step heavy cold rolling at a reduction rate between 81 and 95 percent to obtain a final sheet thickness, decarburization annealing of the cold rolled steel sheet, and final annealing, the improvement which comprises obtaining the final steel sheet or strip thickness by a plurality of rolling passes of the heavy cold rolling through various interim sheet thicknesses and holding the steel sheet at a temperature be-

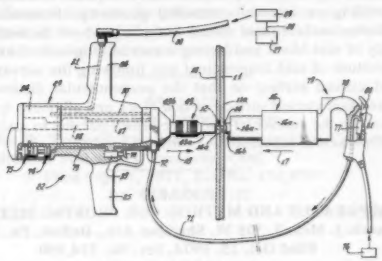
tween 100° and 350°C for at least 1 minute during the heavy cold rolling step at least one time between the above plurality of rolling passes.

3,933,025

HIGH SPEED RIVETING SYSTEM

Franklin S. Briles, 3600 Catamaran, Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 455,555, March 28, 1974. This application May 3, 1974, Ser. No. 466,536
Int. Cl.² B21J *15/20, 15/30;* B23P *11/00*
U.S. Cl. 72—391 **10 Claims**



1. In a gun for upsetting the shank terminal of metallic rivet projecting through work, the rivet also having a head spaced from said terminal, the combination comprising

a. structure including a plunger to be driven forwardly for transmitting upsetting force to be delivered to said terminal,

b. means including a piston to drive the plunger forwardly after back-up force is applied to the rivet head,

c. a chamber to store working fluid pressure, a control valve, and a trigger actuated valve for releasing the passage of control fluid pressure to operate the control valve for releasing working fluid pressure to actuate the piston,

d. said structure including a forwardly extending tubular barrel, and an anvil element carried by and movable relative to the barrel between the plunger and rivet terminal to receive said upsetting force and to transmit same to the rivet terminal, there being a spring urging the anvil element forwardly relative to the plunger, the anvil extending in front of the plunger, the anvil element having generally frusto-conical recess means to receive and confine the tip of the rivet terminal during upset formation, said recess means including first and second conical recesses, the first recess located between the second recess and the forward end of the anvil, the first and

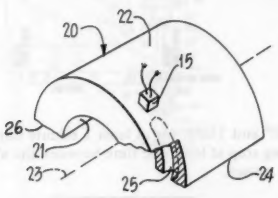
second recesses defining respective generally conical angles α and β, and wherein α is substantially greater than β.

3,933,026

ULTRASONIC CALIBRATION STANDARD

William C. Ham, 360 Panoramic Way, Apt. F; Francis J. Dodd, 2228 Dwight Way, No. 4, both of Berkeley, Calif. 94704, and Spencer J. Friedrick, 1349 Rose St., Apt. C, Berkeley, Calif. 94702

Filed July 31, 1974, Ser. No. 493,446
Int. Cl.² G01N 29/04
U.S. Cl. 73—1 R **11 Claims**



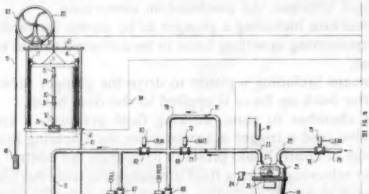
1. An improved ultrasonic calibration standard for use in calibrating an ultrasonic inspection system for testing components fabricated from a component material having known ultrasonic wave propagating properties, said standard comprising a solid monolithic block fabricated from a material having ultrasonic wave propagating properties substantially similar to said component material, said block having at least one curved surface of predetermined curvature and means for providing an internal controlled geometry ultrasonic wave reflector surface, said means including a bore formed internally of said block and having a curved longitudinal axis, the curvature of said longitudinal axis following the curvature of said curved surface so that the perpendicular distance between said curved surface of said block and all points lying on a line on the surface of said bore drawn parallel to said longitudinal axis is substantially constant.

3,933,027

APPARATUS AND METHOD FOR PROVING METERS

Francis J. Mehall, 305 W. Sheridan Ave., DuBois, Pa. 15801

Filed Oct. 15, 1974, Ser. No. 514,950
Int. Cl.² G01F 25/00
U.S. Cl. 73—3 **14 Claims**



1. The method of proving gas meters and the like comprising the steps of:

measuring a unit volume of a selected fluid in a proving standard and providing an electrical output signal consisting of a first plurality of pulses generated in accordance with the measurement reading of said unit volume provided by said standard's volume indicator, said pulses corresponding to predetermined unit measures of time;

measuring the same unit volume of said selected fluid in a meter under test and providing another electrical output signal consisting of a second plurality of pulses generated in accordance with the measurement reading of said unit volume as provided by said meter's volume indicator, said second pulses also corresponding to said same predetermined unit measures of time;

entering said first and second plurality of pulses into computing apparatus, said computing apparatus then operating to provide a signal output comprising the correlation ratio of said first plurality of pulses to said second plurality of pulses; and

displaying said signal output as a measure of calibration between the proving standard and the meter under test;

said step of measuring a unit volume in said proving standard and providing an electrical output signal consisting of enabling a first pulse gate circuit upon initiation of the measuring step, feeding pulses of predetermined frequency from a measure clock oscillator to a pulse counter until said unit volume is measured and then inhibiting said pulse gate circuit, and thereafter maintaining the pulse count in said counter until the step of entering said pulses into said computing apparatus occurs; and

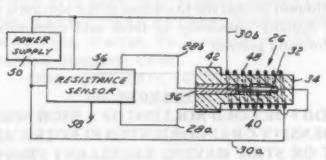
said step of measuring said unit volume in said meter and providing another electrical output signal consisting of enabling a second pulse gate circuit upon initiation of the respective measuring step, feeding pulses of said predetermined frequency from the same said measure clock oscillator to another counter circuit, inhibiting said pulse gate circuit when said unit volume measurement reading is provided by said meter's volume indicator, and thereafter maintaining the pulse count in said second pulse counter until said step of entering said second plurality of pulses into said computing apparatus occurs.

3,933,028

AIR/FUEL RATIO SENSOR FOR AIR/FUEL RATIOS IN EXCESS OF STOICHIOMETRY

Kamlakar R. Laud, Ann Arbor; Eleftherios M. Logothetis, Birmingham, and Kwansuh Park, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 23, 1974, Ser. No. 463,345
Int. Cl.² G01N 7/02, 31/00
U.S. Cl. 73—23 **10 Claims**



6. In a system for monitoring the air/fuel ratio of the combustion mixture provided to an internal combustion engine intended to operate under steady state conditions at a preselected air/fuel ratio wherein an exhaust gas sensor is situated within the stream of exhaust gases produced by the engine and is arranged to produce an electrical signal indicative of the partial pressure of oxygen in the exhaust gases and including electrical means communicating with and responsive to the sensor and arranged to generate an electrical signal indicative of the air/fuel ratio of the combustion mixture, the improvement wherein the exhaust gas sensor is comprised of a cobalt monoxide ceramic sensing element connected electrically in series with a source of electrical energy and the electrical means are arranged to respond to the current flow through said cobalt monoxide sensing element to generate an output signal having a magnitude and polarity indicative of excursion of the air/fuel ratio of the combustion mixture from a selected value in the lean regime.

3,933,029

GAS DETECTOR WITH AUTOMATICALLY OPERABLE FAN SWITCH

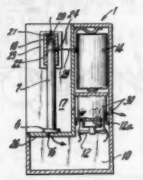
Horst Rabenecker, Bad Schwartau, and Horst Spahrbier, Lübeck, both of Germany, assignors to Drägerwerk Aktiengesellschaft, Germany

Filed Jan. 18, 1974, Ser. No. 434,411

Claims priority, application Germany, Jan. 26, 1973, 2303710

Int. Cl.² G01N 1/22

U.S. Cl. 73—23 5 Claims



1. A gas detector for use with a gas testing tube into which the gas is delivered and which indicates the presence of preselected gases, comprising a housing having an interior cavity and a support wall having a testing tube receiver fitting with an opening therethrough into the cavity, means for holding the testing tube over the receiver fitting, a fan in said housing for drawing a gas sample through the testing tube and receiver fitting and into said cavity, a power cell in said housing, and switch means associated with said testing tube holding means and responsive to insertion of the testing tube therein to connect said power cell to said fan to operate said fan, said testing tube holding means comprising a sleeve carried on said housing and located in alignment with and spaced above said receiver fitting.

3,933,030

SYSTEM FOR CONTINUOUS MONITORING OF THE DENSITY OF CRYOGENIC LIQUIDS VIA DIELECTRIC CONSTANT MEASUREMENTS

Eric O. Forster, Scotch Plains, and William R. L. Thomas, Holmdel, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 9, 1974, Ser. No. 504,143

Int. Cl.² G01N 9/00; F17C 13/02

U.S. Cl. 73—32 R 11 Claims

1. A process for obtaining continuous and simultaneous multiple density measurements of cryogenic liquids at temperatures between −40° to −215°C. in storage tanks yielding an accurate density profile of the cryogenic liquid stored in the tanks to avoid rollover and obtain accurate billing data consisting of the steps of making numerous simultaneous measurements of the dielectric constant and temperature of the cryogenic liquid by means of numerous probes spaced vertically in the tank at some predetermined interval, determining the density using the dielectric constant in a single step independent of knowledge of the absolute material composition of the cryogenic liquid, continuously monitoring the density profile and triggering a pump or circulation system upon monitoring density stratification or inversion in the tank to avoid the occurrence of rollover.

3,933,031

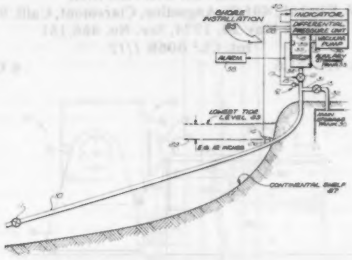
SUBMARINE PIPELINE LEAK LOCATOR OR THE LIKE

William J. Uhlarik, Monterey Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,806

Int. Cl.² G01M 3/28

U.S. Cl. 73—40.5 R 10 Claims



1. Liquid delivery apparatus comprising: an inclined pipeline full of a liquid having a first predetermined density T and having one end mounted in a fixed position in proximity to the shore of a body of water having a second predetermined density S greater than said first predetermined density, said inclined pipeline having its other end located in the water below the elevation of said one end; first means to seal off said one pipe end; second means to seal off said other pipe end; third means submerged in the water and fixed relative to and adjacent the shore, and also connected at a point P_a from said one pipeline end to produce an output directly proportional to the difference between the pressure of the water and that of the liquid in the pipeline; and fourth means to indicate the magnitude of said third means output.

3,933,032

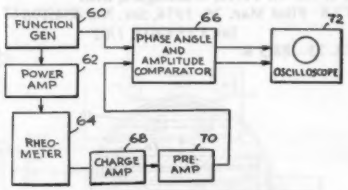
DYNAMIC RHEOMETER

Nicholas W. Tschoegl, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sept. 1, 1971, Ser. No. 176,873

Int. Cl.² G01N 3/32

U.S. Cl. 73—67.1 9 Claims



1. A dynamic rheometer comprising:

a support base,

a piezoelectric transducer means supported on said support base,

means for supporting a specimen to be tested on said piezoelectric transducer means,

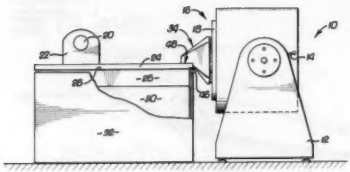
a force pickup transducer,

means for supporting said force pickup transducer on top of said specimen to be tested for generating signals responsive to motion of said specimen,

power means for driving said piezoelectric transducer means for causing compression deflections and flexure deflections to said specimen, and

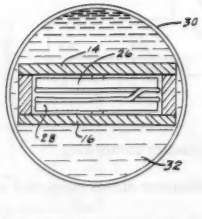
means for comparing the phase and amplitude of the signals applied by said power means to said piezoelectric transducer means and the signals generated by said force pickup means in response to compression and deflection of said specimen.

3,933,033
CANTILEVER DRIVER BAR
David V. Kimball, 481 St. Augustine, Claremont, Calif. 91711
Filed May 20, 1974, Ser. No. 466,151
Int. Cl.² B06B *1/12*
U.S. Cl. 73—71.6 **6 Claims**



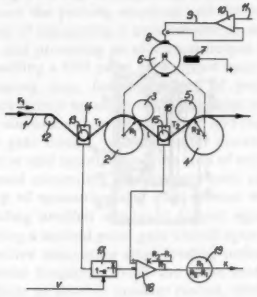
1. In vibration testing apparatus comprising a shaker head carried for high frequency vibration in a horizontal plane, a horizontally disposed slip plate adapted to carry a test piece opposite the shaker head, and a slip plate support block having a planar locus of free sliding engagement with the undersurface of the slip plate; the improvement comprising driver bar means interconnecting said slip plate and shaker head in vibration transmitting relation opposite said support block, said driver bar means comprising a normally vertically disposed base attached to said shaker head and a normally horizontally disposed flange attached to said slip plate, and freely of the plane of said engagement locus; said base defining plural fastening means distributed horizontally and above and below the plane of said flange for fastening together the driver bar base and said shaker head, and said flange defining plural distributed fastening means for fastening said flange to said slip plate.

3,933,034
HYDROSTATIC STRESS GAUGE SYSTEM
James S. Noel, Waco, Tex.; John V. Hobbs, Camarillo, Calif., and Leonard D. Webb, College Station, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Mar. 25, 1974, Ser. No. 454,198
Int. Cl.² G01L *1/02*
U.S. Cl. 73—88.5 R **4 Claims**



1. A hydrostatic stress gage comprising: a sphere of deformable material; a cylinder positioned within the sphere deformable cover means located at each end of said cylinder for forming an enclosure; support means attached to each of said cover means extending into the enclosure; flat conductive coil means mounted on each support means, and an incompressible fluid filling the volume between the sphere and enclosure whereby the distance between said coils varies upon deformation of said sphere.

3,933,035
INSTALLATION FOR CONTINUOUS MEASUREMENT OF THE ELASTIC COEFFICIENT OF A TRAVELING STRIP, WIRE OR RIBBON
Roger Henri Roch, Lausanne, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland
Filed Sept. 5, 1974, Ser. No. 503,295
Claims priority, application Switzerland, Sept. 19, 1973, 13482/73
Int. Cl.² G01N *3/00*
U.S. Cl. 73—95.5 **5 Claims**



1. Apparatus for continuously measuring the elastic coefficient of a moving strip, comprising:

first and second drive means for driving the strip, said second drive means arranged behind said first drive means with respect to the direction of motion of the strip and operable to drive the strip at a speed different from that provided by said first drive means;

first and second tension measuring devices respectively positioned in front of said first and second drive means and operable to continuously provide respective first and second quantities which are proportional to the strip tensions measured at those positions; and

comparison means connected to said first and second tension measuring devices and responsive to said first and second quantities to continuously provide a third quantity which is proportional to the difference in the measured tensions, which is proportional to the elastic coefficient of the strip.

3,933,036
TREAD-WEAR PREDICTION
Seymour A. Lippmann, Huntington Woods, and Kenneth L. Oblizajek, Warren, both of Mich., assignors to Uniroyal Inc., New York, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,595
Int. Cl.² G01M *17/02*
U.S. Cl. 73—146 **6 Claims**

1. A method of predicting tire tread-wear, comprising the steps of:

a. rolling a specimen tire freely upon a laboratory surface at substantially zero degrees of steer and camber;

b. measuring pressure exerted by a selected circumferential rib of said tire normally against said surface at substantially an exit end portion of the tread/surface interface;

c. measuring traction in terms of force/unit area exerted by said selected rib against said surface in a plane of said tread/surface interface and substantially at said exit end portion;

d. repeating steps (a) through (c) for additional specimen tires;

e. measuring the actual amount of tread-wear resulting from rolling each of said tires a selected distance over a test-course surface;

f. substituting the data collected for each said tire from steps (a) through (e) in an equation corresponding to:

$Wr = P_{r,exit} \cdot 0(\tau_{r,exit})$,

wherein

W_r = tread-wear data collected from step (e),

P_r, exit = pressure data collected from step (b),

$\phi(\tau_{r,exit})$ = a statistical distribution function incorporating the prevalence of tread-slip on the test-course surface,

$\tau_{r,exit}$ = the tractive ratio of the data collected in step (c) to the data collected in step (b),

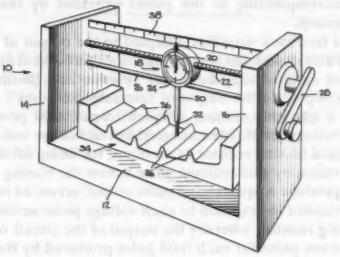
r=said selected tread-rib, and "exit"=the designation for said exit end portion of said tread/surface interface;

g. determining numerical values of the function $\phi(\tau_{r,exit})$ from step (f) for each corresponding rib of each said tire;

h. tabularizing each value determined in step (g) opposite its corresponding tractive ratio constituted by respective ratios of the values measured in step (c) to the values measured in step (b);

i. selecting at least one additional tire whose tread-wear is to be predicted;

j. performing steps (a) through (c) for the selected tire of step (i);



k. selecting a numerical value from the tabularized data of step (h) of the function $\phi(\tau_{r,exit})$ corresponding to the tractive ratio of the latter said tire as determined from the data collected from step (j); and

l. substituting the numerical value for $\phi(\tau_{r,exit})$ determined in step (k) and the pressure value determined in step (j) in an equation corresponding to the equation recited in step (f) to determine anticipated tread-wear of the designated rib r of the selected tire of step (i); said step (e) comprising:

forming a plaster casting of a portion of each tread of said steps (a) and (d) in both a new and worn condition, the plaster during the formation of the castings penetrating the tread-grooves between neighboring circumferential tread-ribs and thereby presenting raised casting ribs;

measuring the depth of each of the corresponding new and worn-condition tread castings from reference points constituted of the respective raised casting ribs; and

comparing the relative depths of the corresponding castings to determine actual tread-wear.

3,933,037

DEVICE INCLUDING A THERMOSTATIC ENCLOSURE, WHICH IS SUSPENDED FROM A TROPOSPHERIC BALLOON

Irénée Alet, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Jan. 29, 1974, Ser. No. 437,640

Claims priority, application France, Feb. 6, 1973, 73.04080

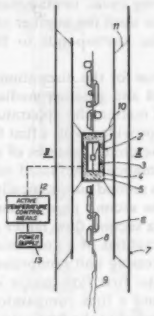
Int. Cl.² G01W *1/08*

U.S. Cl. 73—170 R **13 Claims**

1. A device adapted to be suspended from a tropospheric balloon in a substantially constant temperature environment comprising:

an apparatus which requires for its correct operation that the temperature thereof be maintained between narrow limits for periods in excess of 24 hours;

means for maintaining the temperature of said apparatus between narrow limits for periods in excess of 24 hours, said temperature maintaining means comprising a thermally insulated enclosure surrounding and supporting said apparatus, means for providing a solar radiation barrier comprising a sheath open at both ends and having



a greater cross-section and greater length than the cross-section and length respectively of said enclosure and connection means for attaching and suspending said enclosure within said sheath with a substantial clearance between the enclosure and the sheath extending over the entire length of the sheath, said connection means including a plurality of cord-like elements having a poor thermal conductivity whereby free circulation of the surrounding air is permitted between said sheath and said enclosure by natural convection.

3,933,038

VOLUMETRIC DETERMINATION OF CONTAMINATED LIQUID OR GASEOUS MEDIA

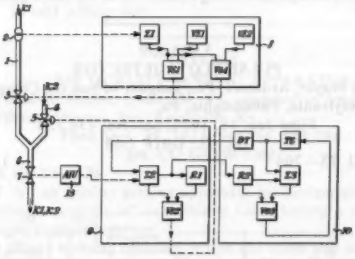
Hans Wilhelm Valentin, Hurth-Knapsack; Kurt Schmeiser, Cologne, and Paul Beuth, Hurth, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 28, 1974, Ser. No. 484,139

Claims priority, application Germany, July 30, 1973, 2338622

Int. Cl.² G01F *25/00*

U.S. Cl. 73—194 R **8 Claims**



1. A method for the discontinuous measurement of the volume of liquid and gaseous media, respectively, contaminated with solids, by alternately flowing a pure medium of an accurately measured volume and a contaminated medium of unknown volume which is to be measured through a measuring device delivering its measured results in the form of pulses; storing the number of pulses delivered by the passage of said

pure medium through the measuring device; flowing contaminated medium through the measuring device until the number of pulses delivered by the measuring device corresponds to the number of stored pulses; flowing said pure medium through the measuring device and storing the number of pulses delivered; comparing the last number of pulses stored with the number of pulses delivered and stored on the previous passage of said pure medium through the measuring device; modifying the number of pulses last stored by half the difference between the two stored numbers of pulses; and passing, in the next following metering cycle, contaminated medium through the measuring device until the number of pulses delivered by the measuring device corresponds to the modified number of pulses.

2. An apparatus for the discontinuous measurement of the volume of liquid and gaseous media, respectively, contaminated with solid matter, the apparatus comprising

a. a first pipe provided with a first flowmeter permitting the supply of metered quantities of a pure medium and with a first automatically actuated valve; a second pipe provided with a second automatically actuated valve, the first pipe and the second pipe leading into a third pipe provided with a second flow meter permitting the supply of metered quantities of a contaminated medium;

b. a first processing unit comprised of a first counter connected to the first flow meter in said first pipe; a first presetter, and a first comparator; said first comparator being connected to the first automatically actuated valve, to the first counter and to the first presetter, and closing the first automatically actuated valve in said first pipe when a quantity of pure medium adjusted in the first presetter has passed through the first flowmeter;

c. a second processing unit comprised of a second counter connected to the second flowmeter in said third pipe, a first register, and a second comparator; the second comparator being connected to the second automatically actuated valve, to the second counter and to the first register, and closing the second automatically actuated valve in said second tube when an amount of contaminated medium which has passed through the second flowmeter in said third pipe has produced a number of pulses which is equal to the number of pulses stored in the first register from the previous passage of the quantity of pure medium through the second flowmeter;

d. a third processing unit comprised of a second register, a third counter, a third comparator, a clock generator, and a divider, said divider being connected to the clock generator, to the third counter, and to the second counter of the second processing unit; the second register being connected to the third counter, to the third comparator, to the first register, and to the second counter; and the third comparator being connected to the clock generator.

3,933,039

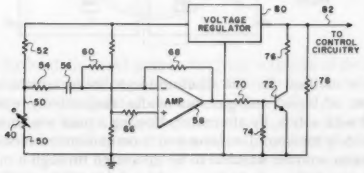
PULSE FLOW DETECTOR

Robert Mayer, Ardmore, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 18, 1974, Ser. No. 434,534

Int. Cl.² G01F *1/68*

U.S. Cl. 73—204 **1 Claim**



1. In a fluid injection system having an injection pump which periodically produces fluid pulses in a fluid stream, a fluid pulse flow detector circuit comprising:

a. a power supply for producing a first power supply voltage;

b. a voltage regulator coupled to said power supply for producing a second power supply voltage which is relatively low compared to said first power supply voltage;

c. a thermistor disposed in the fluid stream and coupled to said second power supply voltage with the thermistor being heated by the flow of current through it and cooled by fluid pulses in the fluid stream, and with the cooling resulting in a decreased resistance in the thermistor;

d. a limiting resistor coupled in series with said thermistor across said second power supply voltage, said limiting resistor functioning to limit the current through the thermistor, and the limiting resistor and thermistor functioning as a voltage divider network with the voltage across the thermistor varying with its resistance in dependence upon temperature, whereby each fluid pulse which cools the thermistor results in a voltage pulse across the thermistor;

e. a pulse filter means, coupled to the output of said thermistor and including a series coupled resistor and capacitor, for passing only pulses having frequency components corresponding to the pulses provided by the injection pump;

f. a feedback amplifier, coupled to the output of said pulse filter means, for amplifying the output of said pulse filter;

g. a series coupled limiting resistor and biasing resistor coupled to the output of said amplifier; and

h. a transistor means, coupled to said first power supply voltage and further coupled to receive the voltage across said biasing resistor as an input, for being driven to saturation by each voltage pulse across the biasing resistor to produce a squarewave pulse output across an output load resistor in response to each voltage pulse across the biasing resistor, whereby the output of the circuit is a squarewave pulse for each fluid pulse produced by the injection pump.

3,933,040

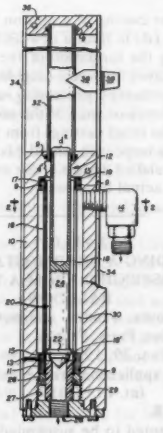
FLOWMETER

Henry Christian Thompson, Huntington Bay, N.Y., assignor to Metco, Inc., Westbury, N.Y.

Filed Nov. 7, 1973, Ser. No. 413,721

Int. Cl.² G01F *1/22*

U.S. Cl. 73—208 **4 Claims**



1. Flowmeter comprising:

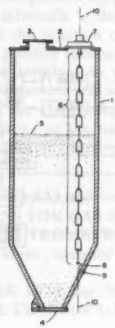
a. housing means forming at its upper end a centrally located tubular guide means;
b. said housing means having a centrally located chamber terminating at its upper end at said tubular guide and communicating with a gas outlet;
c. gas tube means mounted in said chamber having a gas escape slot opening to said chamber and communicating at its lower end with a gas inlet, calibration means carried by said housing means to change the axial position of the gas tube means;
d. float means adapted to slidably move up and down within said gas tube means and said tubular guide means, said tubular guide means having a length at least 0.1 times the diameter of said float means so as to provide a good sliding contact surface for the float means as it moves up and down therein; and
e. sight glass means mounted on the upper portion of the housing means co-axial with the float means and said tubular guide means for viewing movement of the upper portion of the float means therein, said sight glass means being sealed at its upper end forming shock absorbing means to compensate for movement of the float means therein.

3,933,041

BULK MATERIAL LEVEL MEASURING SYSTEM

Frank S. Hyer, Duxbury, Mass., assignor to Hyer Industries, Inc., Pembroke, Mass.

Filed Sept. 30, 1974, Ser. No. 510,422
Int. Cl.² G01F *23/00*; H01H *35/18*
U.S. Cl. 73—290 R **18 Claims**



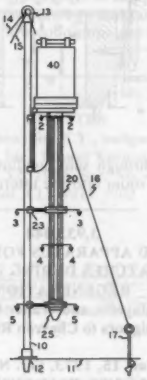
1. Apparatus for measuring the level of bulk material comprising, in combination,
an elongate member, each lengthwise element of said member being rotatable through a predetermined angle about a lengthwise axis relative to each adjacent element, each element being adapted for transmitting torque to said adjacent elements at the limits of said angle, and formed to develop appreciable resistance to rotation about said axis by reaction against said bulk material,
means to suspend said member with said axis extending between points displaced vertically to subtend the levels to be measured,
means to apply a drive torque about said axis to the upper end of said member, said torque having sufficient magnitude to rotate the portion of its length above the level of said bulk material but insufficient magnitude to rotate the portion reacting against said material,
and means to measure the angle of rotation of said upper end.

3,933,042

WATER LEVEL GAUGE

Norwood H. Rector, and Rodney G. Fredericks, both of Baton Rouge, La., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1974, Ser. No. 458,156
Int. Cl.² G01F *23/26*
U.S. Cl. 73—304 C **9 Claims**



1. An improved liquid level gauge of the variable capacitance type comprising:
a. a stilling well;
b. means for retaining said stilling well in a predetermined relationship with respect to a liquid whose level is to be measured;
c. a first probe inside said stilling well;
d. a dielectric coating on said first probe;
e. a second probe in said stilling well spaced from said probe;
f. means for spacing said first and second probes in a predetermined fixed spaced relationship to each other;
g. a conical end member coupled to said stilling well for admitting liquid whose level is to be measured into said stilling well having a funnel-shape orifice located along the longitudinal axis at the bottom;
h. means for applying an electrical signal to said first and second probe; and,
i. means for measuring the signal between said probes which is related to the change in capacitance between said first and second probes depended upon the amount of liquid in said stilling well.

3,933,043

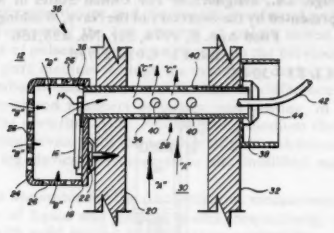
AIR QUALITY SENSING APPARATUS

Bernard R. Shuler, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 25, 1974, Ser. No. 509,284
Int. Cl.² G01W *1/02*
U.S. Cl. 73—336 **5 Claims**

1. An air quality sensing apparatus for determining predetermined qualities of air within a room having a return air system, comprising:
a sensor housing disposed within the room and adapted to contain air quality sensing means, said housing having a plurality of aperture means to provide fluid communication between the interior of the room and the interior of said housing; and,
siphon means comprising a conduit open to the interior of said housing, said conduit having a plurality of apertures formed in its wall and said apertures in the wall of said conduit being disposed in the return air stream such that return air flowing in the return air system flows past said

apertures creating low air pressure areas at said apertures in the wall of said conduit to draw air from the interior of



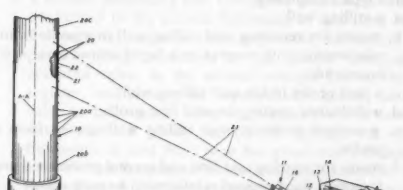
said housing through said conduit and hence from the interior of the room into the interior of said housing.

3,933,044

METHOD AND APPARATUS FOR MONITORING TEMPERATURES DURING CATALYTIC REGENERATION

D. Roger Loper, Lafayette, and Walter E. Fauerso, Richmond, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 15, 1973, Ser. No. 341,626
Int. Cl.[2] G01J 5/08; B01J 37/08; G01N 25/48
U.S. Cl. 73—355 R 4 Claims



1. Apparatus for monitoring the regeneration of a catalyst located within an insualtion-clad vessel involving elevating the temperature interior of said vessel after production of hydrocarbon products such as petrochemicals, gasoline, light fuel oils, and the like, has been terminated, comprising:

1. a plurality of metallic stud means affixed to the metallic sidewall of said vessel associated with a similarly oriented spatial position interior of said vessel, for defining a true temperature gradient for catalyst regeneration interior of said vessel as said vessel is utilized in a catalyst regeneration operating mode;
2. an infrared scanning and detection unit responsive to infrared energy in a frequency frange from about 300×10^9 to 10^{15} Hz, for the purpose of detecting said infrared energy emitted from said plurality of stud means during operation of said vessel in said regeneration mode, and displaying said energy as a function of geometric and time variables indicative of the geographic positions of said stud means as viewed from a scanning station exterior of said vessel, said infrared scanning and detection unit including:

A. infrared camera means for generating electrical signals as a function of detected infrared energy;

B. means for allowing said infrared camera means (A) to be movably positioned at a series of vertically separated viewing stations along a pathway extending upwardly from ground level, each being horizontally adjacent to a selected group of said stud means of said vessel;

C. control means fixably positioned relative to said vessel but electrically connected to said motion allowance means (B) and camera means (A) for controlling movement of said camera means (A) along said vertical pathway, said control means also including first cooperative switch means for controlling operation of said camera means (A) to allow detection of said infrared signals at least when said camera means (A) is stationary relative to said vessel at each of said viewing stations;

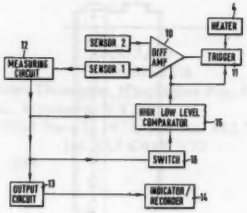
D. recording circuit means also fixedly positioned relative to said vessel, but electrically connected to said camera means (A) for recording said electrical signals generated by said camera means (A) due to the detection of infrared energy emitted from said plurality of stud means of said vessel.

3,933,045

TEMPERATURE MEASUREMENT

Ronald Howard Fox, Chorley Wood, and Arthur James Solman, London, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 30, 1971, Ser. No. 138,916
Claims priority, application United Kingdom, May 1, 1970, 21078/70
Int. Cl.[2] G01K 1/16, 7/14
U.S. Cl. 73—359 4 Claims



1. Apparatus for measuring the core temperature within a body, in a region thereof which is inaccessibly remote from the outer surface of the body, in an instance where the body exhibits a fall in temperature from said region to said surface, comprising:

a sandwich assembly of two temperature sensors separated by a layer of material resistant to thermal conduction which extends in continuous manner laterally beyond the sensors to form an annulus around said sensors having lateral dimensions of at least equal order to those of said sensors;

said sandwich being superposed by an electrical heating element; control means operable in response to a temperature measurement differential indicate by said sensors to energise said heating element to annul said differential, said control means comprising means to energise said heating element continuously to elevate the temperature at one of said sensors to a predetermined high level; and

switch means operable thereafter to put said temperature differential annulling operation into effect.

3,933,046

LOGARITHMIC RESISTANCE-TO-FREQUENCY CONVERTER

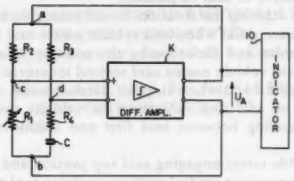
Dietrich Meyer Ebrecht, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1973, Ser. No. 332,734

Claims priority, application Germany, Mar. 1, 1972, 2209770

Int. Cl.² G01K 7/24

U.S. Cl. 73—362 AR 9 Claims



1. A logarithmic resistance-to-frequency converter which produces a square-wave signal whose period is proportional to the natural logarithm of a resistance ratio comprising, a comparator amplifier having two input terminals and two output terminals, a first resistor, a second resistor connected in series with said first resistor to form first and second arms of a bridge circuit with said resistance ratio being determined by the resistance ratio of said first and second resistors, a third resistor, a fourth resistor, a capacitor, means connecting the third resistor in circuit to form a third arm of the bridge and the series combination of said fourth resistor and said capacitor as the fourth arm of the bridge, means connecting the bridge input terminals to the comparator amplifier output terminals and the bridge output terminals to the comparator amplifier input terminals so that the junction of the first and second bridge arms supplies a positive feedback voltage to the comparator amplifier input terminal to which it is connected whereby the circuit arrangement will self-oscillate to produce a square-wave signal at the comparator amplifier output terminals whose period varies as the natural logarithm of the resistance ratio of said first and second resistors.

3,933,047

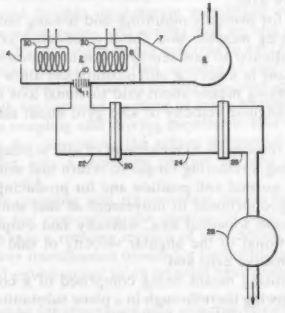
METHOD AND MEANS FOR GAS SAMPLING IN MASS SPECTROMETRY

Peter Fowler, Ipswich, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed Aug. 15, 1974, Ser. No. 497,752

Int. Cl.² G01N 1/22

U.S. Cl. 73—421.5 R 17 Claims



1. A method for sampling gas from an environment of comparatively high pressure and introducing same into a mass spectrometer gas analyzer under relatively low pressure which comprises: providing an enclosed zone having an inlet in communication with said environment, an outlet and a separate sample admission port in communication with said mass spectrometer; maintaining the pressure in said enclosed zone intermediate that of said environment and that of said mass spectrometer; causing sample gas from said environment to flow through said inlet and said outlet under critical flow conditions; and causing a portion of sample gas contained in said enclosed zone to flow through said sample admission port under free molecular flow conditions and into said mass spectrometer gas analyzer.

3,933,048

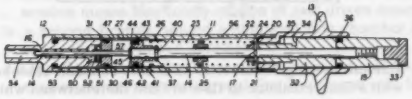
PIPETTES

Emil A. Scordato, Bronxville, N.Y., assignor to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,765

Int. Cl.² B01L 3/02

U.S. Cl. 73—425.6 17 Claims



1. A pipette for aspirating a predetermined volume of liquid into a reservoir and thereafter discharging said liquid from the reservoir, said pipette comprising, a first air chamber, a first piston movable in said air chamber, said piston being movable a set distance to aspirate a predetermined volume of liquid into a reservoir, a second air chamber, a second piston movable in said second air chamber, said second piston being movable to expel liquid from the reservoir, the piston area of said second piston being substantially greater than the piston area of said first piston, actuating means movable between two limiting positions for moving said first and said second pistons in said air chambers, a first fixed stop for arresting said actuating means in one limiting position, a second fixed stop for arresting said actuating means in the other limiting position, and means for connecting said second air chamber to said first air chamber as said actuating means approaches said first stop whereby air in said second air chamber aids in expelling liquid from the reservoir and for separating said air chambers when said actuating means is arrested by said first fixed stop so that the volume of liquid aspirated into the reservoir is controlled only by the movement of said first piston in said first air chamber.

3,933,049

DECOMPRESSION INDICATING INSTRUMENT FOR DIVERS

Ralph B. Shamlian, San Francisco, and Ashley J. Hollingsworth, Atherton, both of Calif., assignors to Farallon Industries, Inc., Belmont, Calif.

Filed July 3, 1974, Ser. No. 485,455

Int. Cl.² G01F 23/14

U.S. Cl. 73—432 R 17 Claims

1. In a decompression indicating instrument for divers:

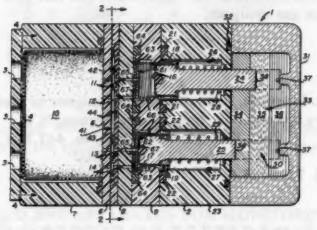
ambient pressure sensing chamber means containing a working fluid therein, said working fluid being subjected to hydrostatic pressure when the instrument is submerged in water;

time-constant chamber means;

fluid communication means disposed intermediate said sensing and time-constant chamber means for providing fluid communication therebetween;

delay means operatively associated with said fluid communication means for delaying the flow of fluid from said sensing chamber to said time-constant chamber with a first half time delay characteristic to simulate uptake of

gas by human tissue of a first tissue half time, and for delaying the flow of fluid from said time-constant chamber to said ambient sensing chamber with a second half time delay characteristic longer than said first tissue half time delay characteristic to approximate outgassing of human tissue under the ambient hydrostatic pressure of the instrument, said delay means including a check valve means in said fluid communication means, said check valve means being connected for passing fluid from said



ambient sensing chamber to said time-constant chamber with a first resistance to flow of fluid therebetween while providing a second resistance to fluid flow from said time-constant chamber to said ambient sensing chamber, said second resistance to fluid flow being greater than said first resistance to fluid flow, and

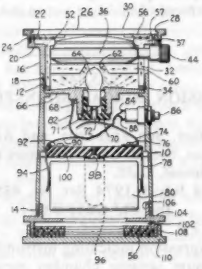
indicating means operatively associated with and responsive to the fluid pressure in said time-constant chamber for indicating to the diver whether decompression is necessary.

3,933,050

SPEED CALCULATOR

John L. Burch, Decatur, and James C. Billions, Huntsville, both of Ala., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,563
Int. Cl.² G01P 3/64
U.S. Cl. 73—488 **5 Claims**



1. An apparatus for measuring the velocity of a vehicle traveling between first and second measured points comprising:

a cylindrical housing comprising a separable, cylindrical, cup-shaped, top portion having an open top end;

a separable, removable transparent disk carried adjacent said open top end of said top portion;

indicia representing speed calibrations circumferentially spaced adjacent an outer perimeter of said disk;

a stopwatch carried in said cup-shaped top portion below said disk;

said stopwatch having a rotatable hand which rotates at a predetermined rate under said indicia when started;

a separable cylindrical member encompassing said stop watch and supported within said cup-shaped top portion;

an upwardly extending reference element carried on said cylindrical member at the upper end thereof;

said transparent disk having an opening therein into which said upwardly extending reference element extends for positioning said transparent disk in a predetermined position relative to said stopwatch;

means for starting the rotation of said rotatable hand from a reference point when said vehicle passes said first measured point and for stopping the rotation of said hand when said vehicle passes said second measured point;

whereby said hand when stopped points to said calibrated indicia on said disk indicating the velocity said vehicle was traveling between said first and second measured points;

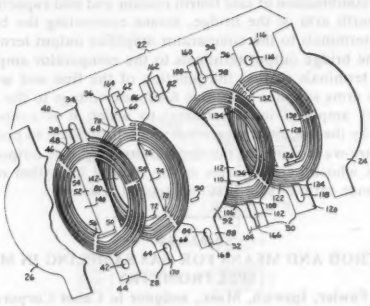
a removable cover engaging said top portion and comprising a transparent central portion overlying said stopwatch and said disk whereby said cover may be removed and said disk readily replaced with an alternate disk.

3,933,051

CLOSED LOOP FLUIDIC ANGULAR RATE GYRO

Carl Gustave Ringwall, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,756
Int. Cl.² G01C 19/28
U.S. Cl. 74—5.6 B **15 Claims**



1. A closed loop fluidic angular rate gyro having a single sensitive axis, comprising:

a. a supporting member;

b. means for sensing movement of said gyro about said sensitive axis;

c. means for pivotally mounting said sensing means to said supporting member and about a torsional axis which is perpendicular to said sensitive axis to maintain said sensing means in a normal null position and allow rotation of said sensing means about said torsional axis in response to the angular velocity of said gyro about said sensitive axis;

d. means responsive to movement of said sensing means for providing a restoring torque to return said sensing means to said normal null position and for producing an output signal proportional to movement of said sensing means about said torsional axis, whereby said output signal is proportional to the angular velocity of said gyro about said sensitive axis; and

e. said sensing means being comprised of a coil having a fluid flowing therethrough in a plane substantially parallel to a plane established by the intersection of said torsional axis and said sensitive axis when said coil is in the normal null position, whereby the angular momentum of said

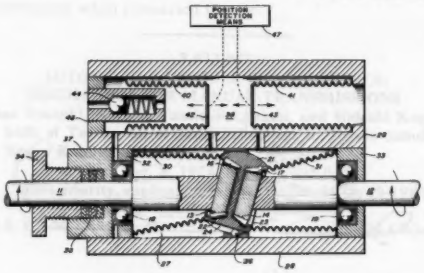
fluid flowing through said coil causes an angular displacement of said coil about said torsional axis in response to the angular velocity of said gyro about said sensitive axis.

3,933,052

PRESSURE COMPENSATED HERMETICALLY SEALED TRANSMISSION SYSTEM

Carl R. Coles, 619 Barberry Road, R.D. 1, Center Valley, Pa. 18034

Filed Oct. 21, 1974, Ser. No. 516,206
Int. Cl.[2] F16J *15/50*, *15/52*
U.S. Cl. 74—18.1 5 Claims



1. A power transmission device comprising

a. a hermetically sealed chamber having a first opening in a first wall of said chamber, and a second opening in an opposing rear wall of said chamber, said openings having a common axis;

b. rigid transmission means, capable of being wobbled, nonrotatably engaging the interior wall of said chamber, said transmission means being arranged to wobble about a substantially fixed point lying substantially along said common axis;

c. a first flexible imperforate membrane engaging said transmission means and sealing said first opening;

d. a second flexible imperforate membrane engaging said transmission means and sealing said second opening;

e. a rotatable driving member external to said chamber and extending through said first opening of said chamber;

f. a driven member external to said chamber and extending through said second opening of said chamber;

g. means coupling said driving member to said transmission means for converting the rotary motion of said driving member into a wobbling motion of said transmission means; and

h. means coupling said transmission means to said driven means for converting the motion of said transmission means into a rotating motion of said driven means.

2. A power transmission device for transmitting power from an external environment to an internal environment comprising

a. a housing for separating said external environment from said internal environment, said housing having a first opening in a first wall communicating with said external environment, said housing having a second opening in an opposing rear wall communicating with said internal environment, said openings being aligned along a common axis and forming the ends of a first chamber within said housing, a third opening in said first wall and a fourth opening in said rear wall forming a second chamber within said housing;

b. transmission means within said first chamber of said housing being adapted to wobble about a fixed point lying substantially in said common axis;

c. a rotatable driving member extending from said external environment through said first opening of said housing;

d. means coupling said driving member to said transmission means for converting the rotary motion of said driving member into a wobbling motion of said transmission means;

e. a first bearing housed within said first chamber for supporting said driving member;

f. a driven member external to said housing and extending from said internal environment through said second opening of said housing;

g. means coupling said transmission means to said driven means for converting the wobbling motion of said transmission means into rotary motion of said driven means;

h. a second bearing housed within said first chamber for supporting said driven member:

i. a first flexible imperforate membrane engaging said transmission means and sealing said first opening at said first bearing;

j. a second flexible imperforate membrane engaging said transmission means and sealing said second opening at said second bearing;

k. a third flexible imperforate membrane affixed to an inner wall of said second chamber and sealing in communication said third opening and a fifth opening extending from said second chamber to said first bearing on the external environmental aide thereof;

l. a fourth flexible imperforate membrane affixed to said inner wall of said second chamber and sealing said fourth opening, while permitting a sixth opening to be unsealed between said first chamber and said second chamber; and

m. pressure sensitive means covering said third opening.

3. Apparatus for detecting the reliability of a hermetically sealed torque transmission system, wherein said system includes a first shaft extending from an external environment into said system, and a second shaft extending from an internal environment into said system, comprising

a. a housing extending from said external environment to said internal environment, and forming a chamber therewithin including

1. a first opening at an external environmental side thereof;

2. a second opening at an internal environmental side thereof; and

3. a third opening extending through to the interior of said system;

b. a first flexible imperforate diaphragm engaging an inner wall of said chamber and sealing said first opening;

c. a second flexible imperforate diaphragm engaging said inner wall of said chamber and sealing said second opening, whereby said diaphragms jointly seal said third opening from normally free communication with either of said first or second openings; and

d. pressure checking means covering said first opening, whereby with constant pressure in said external and internal environments, a change in pressure detected by said pressure checking means occurs upon one or more of the following conditions;

1. a leak or rupture of said first flexible imperforate diaphragm;

2. a leak or rupture of said second flexible imperforate diaphragm;

3. failure of seal of said first opening by said pressure indicating means; or

4. failure of reliability of said hermetically sealed torque transmission system.

3,933,053

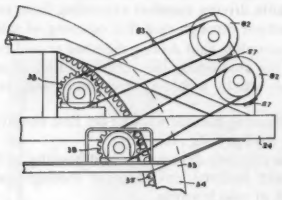
DITCHER

Fred Willie Bartels, Edmonton, Canada, assignor to Banister Pipelines Ltd., Edmonston, Canada

Division of Ser. No. 343,107, March 20, 1973, Pat. No. 3,863,988. This application Aug. 23, 1974, Ser. No. 500,089

Int. Cl.² F16H 55/30, 1/06, 55/12

U.S. Cl. 74—243 R 4 Claims



1. In a ditcher comprising a wheel frame having a non-axially supported digging wheel rotatably mounted thereon, said wheel having a pair of spaced rim assemblies, each said rim assembly having inwardly and outwardly directed side faces, the improvement which comprises:

a row of spaced teeth projecting from each of said side faces adjacent the circumference of said rim assembly to provide a double segment tooth assembly for accepting torque input from a drive sprocket;

at least two double drive sprockets rotatably mounted on the wheel frame adjacent each rim assembly and engaging said rows of teeth to drive the wheel; and

means for rotating the drive sprockets.

3,933,054

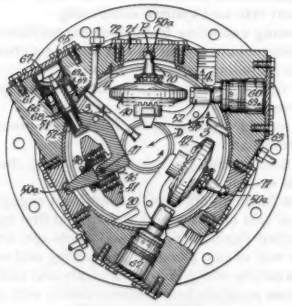
TOROIDAL TRACTION DRIVE

Walter J. Iseman, Monroe Center, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed July 18, 1974, Ser. No. 489,466

Int. Cl.² F16H 15/38

U.S. Cl. 74—200 10 Claims



10. A traction drive comprising,

a casing,

a pair of spaced discs coaxially mounted in the casing for independent rotation about a drive axis and each having a partially toroidal groove,

a plurality of angularly spaced rollers positioned between said discs, each rotatable about a roller axis and in rolling frictional engagement with both of said grooves,

reciprocal means independently mounting each of said rollers for adjustment along an axis extending tangentially of said grooves normal to the roller axis,

each reciprocal means including an arm mounted for rocking movement about the tangential axis to adjust the contact of the roller radially relative to the discs,

means mounting each roller on the associated arm for pivotal movement about a fourth axis normal to the roller axis and tangential axis and parallel to the drive axis when the roller engages both discs equidistant from the drive axis, and

means for maintaining the roller axis intersecting the drive axis.

3,933,055

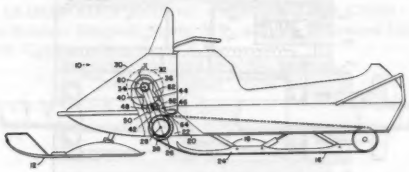
TENSIONING DEVICE FOR A FLEXIBLE DRIVE ELEMENT

Thomas Charles Newhouse, Fond du Lac, and Thomas Herbert Lohr, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Oct. 29, 1974, Ser. No. 518,585

Int. Cl.² F16H 7/12, 7/10

U.S. Cl. 74—242.11 S 6 Claims



1. In combination with a drive of a type including a support on which generally cylindrical drive and driven members are mounted for rotation about parallel axes, a flexible drive element trained about said drive and driven members so as to form first and second runs located on opposite sides of a line of centers passing through said axes, a tensioning device comprising: a tensioning member located between said drive and driven members and extending transversely to said line of centers; said tensioning member including first and second abutment surface means disposed such that said first and second runs extend therebetween and are respectively engaged therewith; at least one aperture located in said tensioning member between said first and second abutment surface means and elongated so as to extend transversely to said line of centers; and a pin extending through the aperture and pivotally mounting the tensioning member on said support between said first and second runs.

3,933,056

SLACK ADJUSTERS

Alistair Gordon Taig, Bristol, England, assignor to Bendix Westinghouse Limited, Bristol, England

Filed Apr. 8, 1974, Ser. No. 458,980

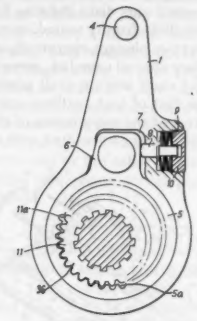
Claims priority, application United Kingdom, May 12, 1973, 22729/73

Int. Cl.² F16H 35/06

U.S. Cl. 74—399 14 Claims

1. A slack adjuster including an angularly movable input member and an angularly movable output member a one member being mounted eccentrically with respect to the other member and having external gear teeth mutually intermeshing

with internal gear teeth of the other member and adjustment means for moving the centre of one said member in relation



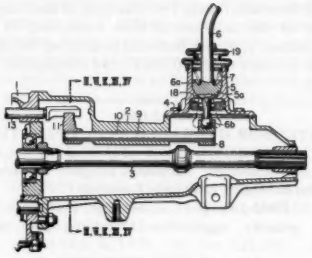
to the centre of the other said member to reduce slack in a mechanism when connected thereto.

3,933,057

AUTOMOTIVE VEHICLE SHIFT CONTROL MECHANISM FOR MANUAL TRANSMISSIONS

Isao Tsuzuki, Kariya; Yasuie Takahashi, and Hideaki Koga, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 8, 1974, Ser. No. 496,025
Claims priority, application Japan, Dec. 29, 1973, 49-1983
Int. Cl.² G05G 9/12; F16H 57/06
U.S. Cl. 74—476 **20 Claims**



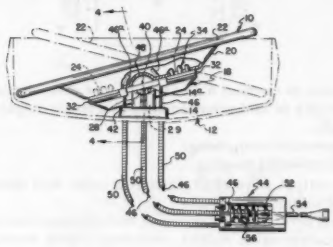
1. In a manual multiple-forward-speed vehicle transmission having transmission means shiftable between a reverse drive and a plurality of forward speed ratios, a manual shift lever controlling said transmission means by movement through a shift pattern of selection positions including a neutral position, said shift lever being connected to shift said transmission means to said reverse drive and to one forward speed ratio by movement thereof, respectively, to a pair of selection positions lying at the ends of a substantially linear path extending across said neutral position, and a transmission lever movable with said shift lever and operatively interconnected between said shift lever and said transmission means; a misshift preventive mechanism for controlling movement of said shift lever along said linear path between said selection positions for said reverse drive and said one forward speed ratio, said misshift preventive mechanism comprising a first projection extending from said transmission lever and arranged to be moved through a range of motion including a prescribed path corresponding to the movement of said shift lever through said linear path, a housing, guide means mounting said housing for rotative movement and for linear movement transversely of said rotative movement, with the range of movement of said housing being defined to include an initial position, a second projection extending from said housing and arranged to be located within said prescribed path of said first projection when said housing is in said initial position, spring means biasing said housing to said initial position, said first projection being configured to effect initial engagement with said second projection to rotate said housing against the force of said spring means out of said initial position when said shift lever is moved into said linear path through said neutral position, with subsequent disengagement between said first and said second projection by movement of said shift lever within said linear path operating to enable said spring means to return said housing to said initial position to place said second projection within said prescribed path of said first projection to cause said housing to undergo said linear movement as a result of reengagement between said first and second projections, and stopper means for limiting said linear movement of said housing thereby to prevent misshifting of said transmission which might occur by movement of said shift lever between said selection positions for said one forward speed ratio and said reverse speed ratio directly through said linear path.

3,933,058

UNIVERSAL SUPPORT FOR VEHICLE MIRROR

Ronald J. Kraine, Garfield Heights, Ohio, assignor to Tenna Corporation, Cleveland, Ohio

Filed Feb. 20, 1974, Ser. No. 444,106
Int. Cl.² F16C 1/10
U.S. Cl. 74—501 M **18 Claims**



1. In a support for effecting limited adjustment in a plurality of planes of a part to be adjusted, comprising, a first supporting member, a second member generally spaced from the first member, a universal joint means connecting said members and effecting limited movement in a plurality of planes therebetween, said joint means being formed of vibration absorbing material and comprising pivotal bearing means coacting with bearing means on said first member for swinging movement of said second member and said joint means relative to said first member in one plane, and said joint means including flexible means for swinging movement of said second member relative to said first member in another plane.

3,933,059

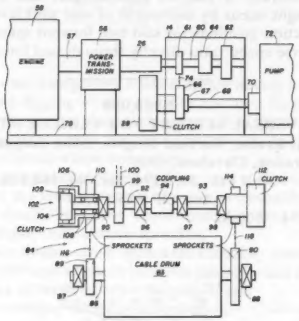
DEEP DRILLING MACHINE DEMOUNTABLE FOR HELICOPTER TRANSPORT

Theodore B. Houck, Tulsa, Okla., assignor to Parker Drilling Company, Inc., Tulsa, Okla.

Division of Ser. No. 194,182, Nov. 1, 1971, Pat. No. 3,767,329.
This application Mar. 23, 1973, Ser. No. 344,090
Int. Cl.² F16H 37/06
U.S. Cl. 74—661 **5 Claims**

1. In a drilling apparatus for drilling small diameter bore holes deep into the earth, said apparatus designed, for transportation purposes, to be demountable into a plurality of subassemblies, each having a weight less than a specified magnitude, the improvement comprising:

a. a plurality of separate drive subassemblies, each of said drive subassemblies comprising;
1. a drive subassembly housing;
2. an engine;
3. a speed transmission means operable at the high speed of said engine, said transmission means including gear means to provide a plurality of reduced output speeds;
4. means to couple said engine to said transmission, and said transmission to drive means in said drive subassembly;
5. pump means;
6. means including clutch means to connect said pump means to said drive means in said subassembly;
7. means to connect said housings of a plurality of said subassemblies into a single compound assembly housing; and



8. means to connect a plurality of said drive means in a plurality of said subassemblies to a single output drive shaft;

b. a drawworks comprising;
1. a drawworks housing;
2. an output drive shaft, including cable reel means on said output drive shaft;
3. input drive means comprising two separate drive shafts;
4. separate drive means, including clutch means, for coupling drive shaft to said output shaft; each of said drive means of different step-down speed ratio;
5. means to couple said two input drive shafts to turn together; and

c. means to couple the output drive shaft of (a) to the input drive means of (b).

3,933,060

AUTOMATIC LATHE

Hans-Jürgen Leiber, Tramelan, Switzerland, assignor to Kummer Freres S.A., Fabrique de machines, Tramelan, Switzerland

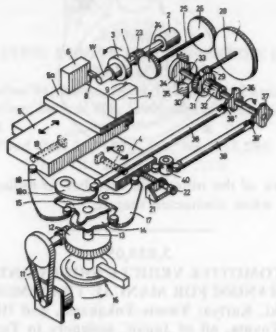
Filed Jan. 27, 1975, Ser. No. 544,519

Claims priority, application Switzerland, Jan. 29, 1974, 1204/74

Int. Cl.² B23B *1/00, 3/28*

U.S. Cl. 82—5 **3 Claims**

1. An automatic lathe comprising a workpiece spindle, a compound slide arrangement embodying a longitudinal slide and a cross-slide, a primary control shaft, two primary cam disks seated on said primary control shaft, transmission levers individually operatively associated with said primary cam disks, said longitudinal slide and said cross-slide each being controlled by said primary cam disks through the agency of the respective individually associated transmission lever, at least two lathe tool supports arranged adjacent one another at the compound slide, a control mechanism which can be switched-on during a portion of each work cycle of the automatic lathe for carrying out a thread chasing operation by means of a thread chasing tool clamped in one of said lathe tool supports, said control mechanism embodying an auxiliary control shaft for driving connection with the workpiece spindle, two auxiliary control cam disks defining first and second auxiliary control cam disks fixedly seated upon said auxiliary control shaft, a respective plunger operatively associated with each slide and auxiliary control cam disk, means for displacing said auxiliary control shaft into an axial position for thread chasing in which the first of said auxiliary control cam disks carries out the control of the movements of the longitudinal slide by means of the plunger associated with said first auxiliary control cam disk and the transmission lever associated with the longitudinal slide and in which the second of the auxiliary control cam disks acts upon the cross-slide by means of the plunger associated with said second auxiliary control cam disk and an additional transmission lever member in order to raise-off the cross-slide from the transmission lever associated therewith for the time duration of each rapid return movement of the longitudinal slide controlled by the first auxiliary control cam disk between successive thread chasing operations in order to lift-off the thread chasing tool from the workpiece.



3,933,061

APPARATUS FOR HYDRAULICALLY OPERATING THE CHUCK OF THE HOLLOW SPINDLE OF A LATHE

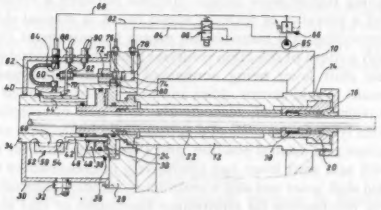
Helmut Link, Esslingen, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Filed July 5, 1974, Ser. No. 485,781

Claims priority, application Germany, July 10, 1973, 2334940

Int. Cl. B23b *19/02, 5/22*

U.S. Cl. 82—30 **9 Claims**



1. In a lathe having a hollow spindle for receiving an elongated workpiece, an axially operable chuck located at its forward end for selectively clamping said workpiece, a hollow shaft located within said spindle and axially reciprocal with respect to said spindle to operate said chuck, a double acting chuck motor comprising a cylinder secured to said spindle and a piston secured to said hollow shaft, said cylinder having two pressure chambers and a cylinder extension coaxially extend-

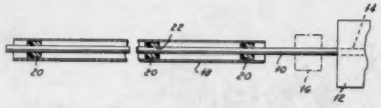
ing to the rear thereof, first duct means in said extension communicating with one of the pressure chambers, second duct means within said extension communicating with the other pressure chamber, each of said ducts having an opening on the peripheral surface of said cylinder extension axially offset from each other, a slidable sleeve surrounding said cylinder extension, said slidable sleeve having radially inwardly directed flanges along its axial edges defining with said extension member an annular space, conduit means secured to said sleeve connecting said space to a source of fluid under pressure, and means for axially shifting said sleeve between the first and second duct means to selectively supply fluid under pressure to one or the other of said pressure chambers thereby actuating said piston to reciprocate said shaft and operate said chuck.

3,933,062

SOUND DEADENING MEANS FOR SCREW MACHINE

Harold J. Huber, 7625 Payne, Dearborn, Mich. 48126

Filed Aug. 2, 1974, Ser. No. 494,096
Int. Cl.² B23B *25/00*
U.S. Cl. 82—38 A **1 Claim**



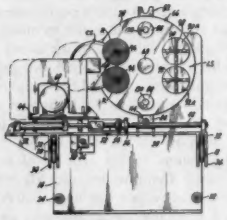
1. The combination comprising an elongated work stock member for feeding into a screw machine, an elongated work stock tube receiving said elongated work stock member, and at least one ring-like member press-fitted onto said work stock member, said ring-like member being fabricated of a plastic material and having a central opening therethrough, said central opening being oval in cross-section, said ring-like member being located at a point remote from the end of the work stock member which is to be operated upon by a screw machine, said ring-like member further being located within said work stock tube.

3,933,063

TURRET ROLL SLITTING MACHINE

Carl A. Stoffels, Flemington, N.J., assignor to Judelshon Industries, Inc., Jersey City, N.J.

Filed Oct. 2, 1974, Ser. No. 511,197
Int. Cl.² B23B *3/04*, *5/14*, *7/00*
U.S. Cl. 82—85 **9 Claims**



1. An improved roll cutting machine for cutting rolls of sheet material at a cutting station in said machine while simultaneously unloading previously cut rolls from said machine and loading new rolls to be cut thereon at a loading and unloading station of said machine comprising:

a. frame means;

b. a turret assembly mounted on said frame means for rotational movement about a turret axis;

c. multiple spindle shafts mounted on said turret and extending parallel to said turret axis including means to support rolls of material to be slit and chuck means engageable with said rolls of sheet material when mounted on spindle shafts;

d. said turret being rotatable to transport at least one spindle shaft to a cutting station at a first location about said turret axis while simultaneously moving at least one other spindle shaft to a loading and unloading station at a second location about said turret axis;

e. cutting means mounted on said frame for longitudinal movement parallel to said spindle shafts and for movement in a plane perpendicular to said spindle shafts to affect cutting of a roll of material mounted on said at least one spindle shaft in said cutting station; and

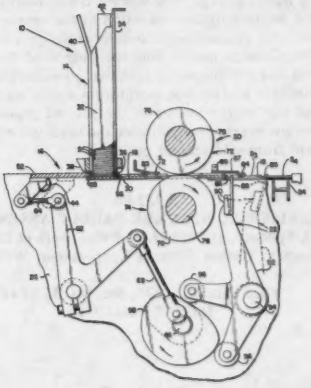
f. drive means for driving said cutting mechanism.

3,933,064

GUM SLAB FEED APPARATUS

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Apr. 25, 1974, Ser. No. 463,909
Int. Cl.² B26D *3/08*
U.S. Cl. 83—11 **21 Claims**



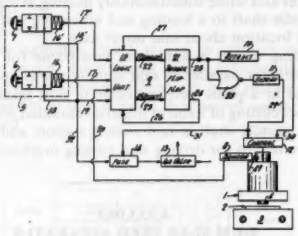
1. Apparatus for feeding gum to a wrapping machine or the like and comprising means defining a substantially horizontal path of gum travel, a magazine feed mechanism for feeding a succession of slabs of gum to and along said path and including a magazine for containing a supply of gum slabs, means supporting said magazine for movement between an active position wherein it extends upwardly from said path to maintain the supply of slabs in vertically stacked relation and an inactive position wherein it is displaced a substantial distance from said active position, and means for successively feeding slabs from the bottom of said magazine to said path and advancing the slabs along said path, and a scoring mechanism mounted in said path for receiving each successive slab advanced by said feeding means and scoring it along a plurality of generally parallel score lines as it advances along said path.

3,933,065

FLUIDIC MACHINE CYCLE CONTROL

George J. Janu, Brookfield, and Donn R. Fischer, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Apr. 18, 1974, Ser. No. 462,296
Int. Cl.² B26D 5/00, 7/24
U.S. Cl. 83—62 32 Claims



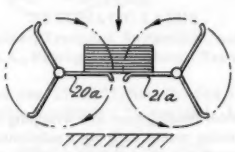
1. A fluid machine control apparatus for a movable working element of a machine comprising a plurality of manually operable fluid signal source means having a first position and operable to a second position, each of said source means generating a plurality of unique fluid signals in response to the movement from the first to the second position to monitor the actuation thereof and the setting of said source means to said second position, sensor means for monitoring the position of the working element and producing a machine position related fluid output signal, a fluid signal logic processing means including fluid signal comparator means including first monitor means monitoring the operation of the source means and the sensor and responsive to simultaneous generation of signals of the source means and the output of the sensor to produce a control output to selectively enable the operation of the machine and second monitoring means monitoring the setting of the source means to the second position and the sensor means to selectively disable the machine in response to movement from said second position.

3,933,066

DUAL SPEED STACKER PADDLE ASSEMBLY

Robert J. Spooner, and Oscar W. Dillon, both of Essex, Conn., assignors to Cashin Systems Corporation, Williston Park, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,144
Int. Cl.² B26D 4/46
U.S. Cl. 83—92 14 Claims



1. In combination a slicing maching having a slicing blade, a feeding means for feeding a product to be sliced by said blade and control means for determining the rate of advance of said feeding means toward said blade, and consequently the sliced thickness, and apparatus for stacking slices of said product as they are discharged by said slicing machine and then transferring the stacks of sliced product, said apparatus comprising in combination:

a paddle stacker to be located adjacent to the discharge end of said slicing machine for receiving the slices discharged therefrom;

a low inertia D. C. motor to rotate the paddles of the paddle stacker at low speed as the slices are being stacked on such paddles and at high speed when the desired size of stack has been achieved, said motor at low speed being synchronized with the rate of advance of said slicer feeding means;

control means coupling the said motor and the paddle stacker for actuating said motor when the desired size of stack has been achieved and rotating the paddles at high speed to transfer the said stack and bring the paddles to the low speed position ready for reception of another stack of slices;

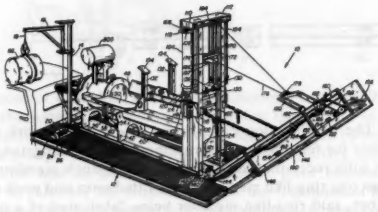
stack receiving means adapted to receive thereon the stacks of sliced product transferred by said stacker.

3,933,067

CUTTER DEVICE FOR CUTTING THERMOPLASTIC MATERIAL

Julius Clark, 224 W. Freeport, Broken Arrow, Okla. 74012

Filed Sept. 24, 1974, Ser. No. 508,905
Int. Cl.² B26D 7/06
U.S. Cl. 83—155 2 Claims



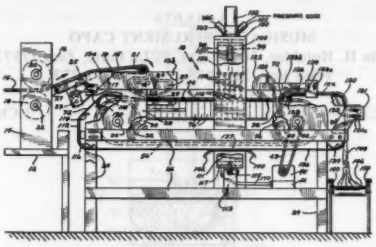
1. A cutter device for cutting thermoplastic material, comprising:

a frame, including support means for portions of thermoplastic materials, pusher means for urging said portions of thermoplastic material toward a first end of said support means, an end plate on said support means, disposed substantially normal thereto, said end plate having a slot therein, a double acting knife blade slidable on said frame operable adjacent to and parallel to said end plate, said double acting knife blade having cutter means positioned thereon slidable in relation to said slot, power means to operate said pusher means and said knife blade, said power means being hydraulic means, and said hydraulic means including control means to operate said hydraulic means selectively, said pusher means including a hydraulic cylinder behind a reciprocable pusher member and in substantial axial alignment therewith to move said pusher member reciprocably, said frame including a hydraulically operable lift member positioned swingably adjacent said support means to receive said thermoplastic material and transfer said material to said support means, said frame including a swinging boom positioned upstandingly adjacent said support means and having hydraulically operable lifting means to lift articles of thermoplastic material and place them upon said lift member, said frame including a conveyor having a conveyor support frame attached pivotally by a first end to said frame adjacent said end plate, a cable having a first end attached to a second end of said support frame and second end attached to a hydraulically operated winch to raise and lower said conveyor, and a hydraulically operated conveyor belt, said conveyor positioned to receive cut portion of thermoplastic material and convey said portion to a remote location.

3,933,068
TRIM REMOVAL BELT FOR DOUGH CUTTING APPARATUS

Jack J. Rejsa, Golden Valley, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed July 26, 1974, Ser. No. 492,080
Int. Cl.² B26D 7/08; B65G 23/18
U.S. Cl. 83—168 **11 Claims**

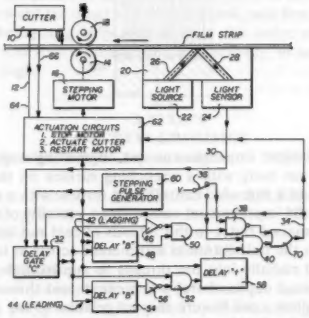


1. An apparatus for cutting bakery goods from an elongated strip of dough, said apparatus comprising a supporting framework, an endless cutting means including a cutting surface member having openings therein, upwardly extending cutting rings around the openings, means for feeding the dough strip onto the top of the cutting rings, means for pressing the dough onto the cutting rings to cut a dough piece from the center of each ring, an endless trim stripping belt comprising flexible sheet material in engagement with the cutting surface member and positioned around the rings in the interstices between the rings on the surface of the cutting means, support means for the belt and means operable with the belt to cause the belt to engage said endless cutting means at a predetermined point prior to the point at which the dough is pressed thereagainst and means for lifting the belt together with the trim thereon from said endless cutting means after the cut pieces of dough have been removed from the trim.

3,933,069
CAMERA FILM PROCESS FILM LOCATING FEED AND CUTTER

Leonard H. Tall, Mercer Island, and Gerald L. Edwards, Seattle, both of Wash., assignors to CX Corporation, Seattle, Wash.

Filed Feb. 6, 1975, Ser. No. 547,379
Int. Cl.² B26D 5/32, 5/34
U.S. Cl. 83—210 **7 Claims**

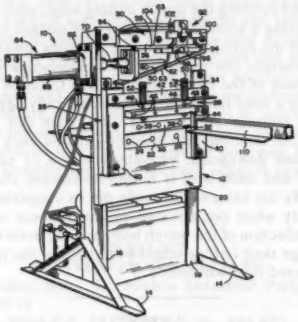


1. Processing apparatus comprising in combination with feed means for longitudinally advancing camera film strip and the like longitudinally therein with either end leading, processing means at a processing station for performing a processing operation on the strip at each of successive positions of advancement thereof by said feed means, said strip having locating elements successively spaced lengthwise along the strip each with opposing first and second longitudinally spaced terminal edges, corresponding first ones of such edges occupying predetermined longitudinal positions on the strip and the corresponding opposing edges longitudinal positions subject to variation, edge detector means operable in predetermined positional relation to the processing station to scan the advancing strip locating elements and provide therefrom first signals from detection of the respective leading ones of such edges and second signals from detection of the respective lagging edges thereby scanned, and control means selectively operable to actuate the processing means in response to each of the leading edge signals with the strip being advanced with one end leading, and alternatively operable to actuate such operating means in response to the lagging edge signals with the strip being advanced with its other end leading.

3,933,070
WEDGE ACTUATED CUTTING AND/OR FORMING TOOLS

Andrew C. Walters, Dallas, and William M. Goss, Richardson, both of Tex., assignors to Fabco, Incorporated, Lewisville, Tex.

Filed Feb. 9, 1973, Ser. No. 331,237
Int. Cl.² B26D 5/08, 5/12
U.S. Cl. 83—529 **12 Claims**



1. A cutting and/or forming tool comprising:

a frame including a fixed platen and guide structure extending in a predetermined direction from the fixed platen for cooperation therewith to define a work area;

a movable platen slidably supported on the guide structure of the frame for reciprocation relative to the fixed platen in the work area;

a wedge supported for sliding movement in a direction extending generally perpendicularly to the predetermined direction and having a camming surface;

means defining a camming surface mounted in engagement with the camming surface of the wedge and adapted for cooperation therewith to reciprocate the movable platen toward and away from the fixed platen in response to reciprocation of the wedge;

fluid powered cylinder means having a predetermined stroke and operatively connected to the wedge for effecting reciprocation thereof and thereby effecting reciprocation of the movable platen in the work area; and

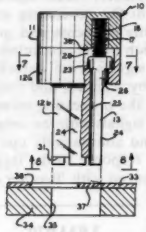
means including a portion mounted on the wedge for reciprocation therewith and a portion mounted on the frame and operatively associated with said cylinder for selectively varying the separation between the fixed and movable platens at the points of minimum and maximum separation during reciprocation of said movable platen.

3,933,071

SHEARPROOF PUNCH

Edward J. Doring, Syracuse, N.Y., assignor to Onondaga Tool Corporation, Fayetteville, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,411
Int. Cl.² B26F 1/12
U.S. Cl. 83—637 4 Claims



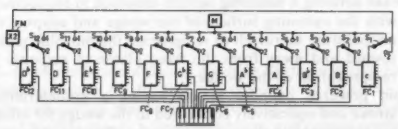
1. A male shearproof punch having a retainer member adapted to be secured to a press, a unitary punch body having an upper portion removably secured to the retainer member and a lower portion having four vertically extending side surfaces, and four heels, each heel being slidably contained in a vertically extending groove in a lower body side surface and extending upward into the upper body portion, the lower body portion and the heels having flat bottom surfaces the edges therearound defining the punch cutting edge, each heel lower portion having a portion of its outer side surface cut away to conform to the configuration of the adjacent lower body side surface, wherein the improvement comprises a slot in the upper surface of the upper body portion for each heel, each heel having a head flatted on two diametrically opposite sides for sliding contact with the slot sides, each slot being of a greater depth than the heel head height, and each heel being spring-biased downward, whereby rotation of each heel is prevented and each heel is biased downward ahead of the punch body for entering a female die to cooperate with the punch body when not arrested by a workpiece in order to prevent deflection of the punch body and the heels are retractable to align their cutting edges with those of the punch body when arrested by a workpiece.

3,933,072

GENERATOR FOR PRODUCING TONES OF A MUSICAL SCALE IN AN ELECTRONIC MUSICAL INSTRUMENT

David Josephus van der Wal, and Frans Grotepas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,781
Claims priority, application Netherlands, Oct. 31, 1973, 7314925
Int. Cl.² G10H 1/00, 5/06
U.S. Cl. 84—1.01 5 Claims



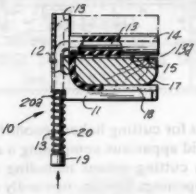
1. Generator for producing tones of a musical scale in electronic musical instruments of the type which comprises one master oscillator and a plurality of frequency converters equal in number to the number of tones per octave, which frequency converters each have an input and at least a first output, the first output of each frequency converter being connected to the input of the next subsequent frequency converter while the input of the first frequency converter is connected to the master oscillator, the improvement comprising a frequency multiplier that multiplies by a factor of 2, means connecting the first output of the final frequency converter to the input of the first frequency converter through said frequency multiplier, and means for switching the master oscillator to the input of any one of the frequency converters and for disconnecting this input from the preceding frequency converter.

3,933,073

MUSICAL INSTRUMENT CAPO

Marvin H. Hutchins, 10503 Ave. P, La Porte, Tex. 77571

Filed Apr. 24, 1975, Ser. No. 571,072
Int. Cl.² G10D 3/08
U.S. Cl. 84—318 3 Claims



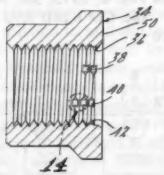
1. A musical instrument capo for changing the key stringed instruments, comprising, an L-shaped body, an L-shaped slide bar slidably carried within said body with cap means and spring means for operating, a rubber sleeve carried upon said slide bar and protective padding secured to said capo for protecting the neck of the instrument.

3,933,074

FATIGUE IMPROVEMENT NUT

Erwin C. Witte, Placentia, and Paul V. Pagel, Fullerton, both of Calif., assignors to Kaynar Manufacturing Co., Inc., Fullerton, Calif.

Filed Dec. 9, 1974, Ser. No. 530,947
Int. Cl.² F16B 31/04
U.S. Cl. 85—32 T 5 Claims



1. In a fatigue improvement nut comprising a generally cylindrical nut body with a wrenching surface on the outer periphery and a threaded central bore for use with a conventional bolt, the improvement comprising a plurality of circumferentially spaced flutes in the threads of said nut extending axially from the bolt entrance end thereof across at least two threads and radially into the threads to approximately four-fifths of thread depth, thereby to weaken said threads sufficiently to allow axial flexure thereof relative to the uninterrupted threads of said nut when subjected axial loads thereby to move the zone of maximum stress transfer between said nut and said bolt from the interface between the engaged and non-engaged threads of said bolt to a zone located substantially centrally of the axial length of said nut.

3,933,075

SELF-DRILLING FASTENER AND METHOD OF MAKING SAME

Roy E. Peterson, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 384,597, Aug. 8, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,095

Int. Cl.² F16B *25/00*

U.S. Cl. 85—41 10 Claims

1. A self-drilling fastener including a generally cylindrical, threaded shank, a drill tip integrally formed on one end portion of said shank, first and second concave grooves formed in opposite sides of said end portion, each groove having a straight axis and appearing to intersect with the axis of the other groove at an acute included angle as measured in a plane extending parallel to the axis of said shank, said angle appearing to be bisected by the axis of said shank as measured in said plane, first and second planar heels formed on said one end between said grooves and intersecting each other at an included angle bisected by the axis of said shank, a chisel edge on the end of said shank defined by the intersection of said heels, first and second cutting edges defined by the intersections of said first and second grooves with said first and second heels, respectively, said cutting edges each being curved concavely both in a direction generally radially of said shank and in a generally axial direction toward the other end of said shank, each of said cutting edges being formed with a positive rake angle along the entire length thereof and said rake angle increasing in magnitude upon progressing along said cutting edge from adjacent said chisel edge and toward the surface of said shank, and first and second peripheral edges defined by the intersections of the planes of said first and second heels, respectively, with the cylindrical surface of said shank, said first and second grooves intersecting said second and first peripheral edges, respectively, at first and second points not beyond the points of maximum progression of said peripheral edges toward the other end of said shank, said first and second points being angularly spaced from the outer ends of said second and first cutting edges, respectively, at an obtuse included angle.

3,933,076

SCREW GROMMET

Toshie Tanaka, Tokyo, Japan, assignor to Nifco Inc., Tokyo, Japan

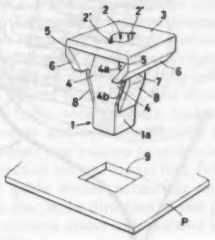
Filed Dec. 9, 1974, Ser. No. 530,633

Claims priority, application Japan, Dec. 20, 1973, 48-145182[U]

Int. Cl.² F16B *13/06*

U.S. Cl. 85—80 5 Claims

1. A one-piece plastic screw grommet for use in a complimentary polygonal-shaped panel aperture, said grommet including a leg having a polygonal cross section and a head at one end which extends laterally in at least two opposite directions from said leg a predetermined distance terminating in a pair of opposite edges, a bore traversing said head and extending axially into said leg, said leg having a first pair of slopes diverging outwardly in the same two opposite directions from its juncture with said head to a point intermediate its length and then converging inwardly along a second pair of slopes toward its opposite end to provide a pair of shoulders at the juncture of said slopes which project outwardly from said leg in the same directions as the edges of the head, the distance from each of said edges to the adjacent shoulder on the leg being substantially equal to said predetermined distance from said edge to the juncture of said head and leg, a pair of first planar means each hingedly connected to one of said edges and each initially extending angularly from one of said edges



to its adjacent shoulder, second planar means hingedly connected to each of said first planar means and initially lying generally in the direction of and along said second pair of slopes, whereby when said grommet leg and said second planar means are inserted into said panel aperture and axial pressure applied to move said first planar means from its initial angular position to a position juxtaposed to said head, said hingedly connected second planar means are angularly moved into engagement with said first pair of diverging slopes and caused to underlie said panel aperture edges in opposition to said head.

3,933,077

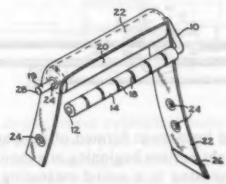
CONVERTER FOR GUITARS

James Dunlop, Bldg. 52, Benicia Industrial Park, Benicia, Calif. 94510

Filed Feb. 20, 1975, Ser. No. 551,093

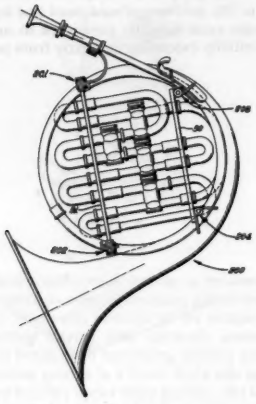
Int. Cl.² G10D *3/00*

U.S. Cl. 84—318 4 Claims



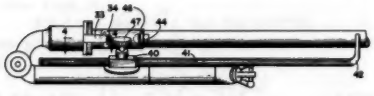
1. A converter for Spanish guitars comprising a spacer member for insertion underneath the strings of the guitar to raise and strings higher above the top surface of the neck of the guitar, said spacer member carrying rotatably mounted thereon a sleeve of elliptical cross-sectional contour, a pressure member supported from said spacer member for application over the strings of the guitar to urge them against said sleeve, and means for detachably securing said pressure member to the neck of the guitar.

3,933,078
MUSICAL HORN CONSTRUCTION
Mark S. Veneklasen, 12338 Montana Ave., Apt. 11, Los Angeles, Calif. 90049
Filed Nov. 2, 1973, Ser. No. 412,334
Int. Cl.² G10D 7/10
U.S. Cl. 84—387 15 Claims



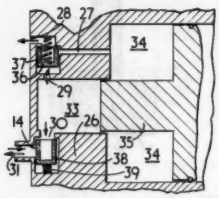
1. In a horn in the form of a brass instrument having multiple valves and tubes defining straight path sections and crooks, the combination comprising
a. a support frame having elongated metallic members and generally annular portions integral therewith, said portions receiving the tube straight path sections therethrough,
b. means removably retaining the tube straight path sections to said frame annular portions, and
c. the tube straight path sections having removable telescopic connection with said crooks.

3,933,079
MUSICAL WIND INSTRUMENT
Earl Joseph Gillespie, Kenosha, Wis., assignor to G. Leblanc Corporation, Kenosha, Wis.
Filed Sept. 6, 1974, Ser. No. 503,962
Int. Cl.² G10D 7/10
U.S. Cl. 84—388 5 Claims



1. In a wind instrument formed of tubular material having an initial straight portion beginning at a mouthpiece receiving end and terminating in a sound-emanating bell portion the combination comprising a plurality of piston valves for the playing of different musical notes, a pair parallel spaced apart tubes held in a fixed relation to the wind instrument and having terminating ends extending in a direction opposite that of the mouthpiece receiving end portion, a slide member having a U-shaped portion leading into a pair of straight parallel spaced apart portions having open ends telescoping with said terminating ends of said pair of parallel spaced apart tubes to slide therealong for the playing of different musical notes, and a bar adjustably secured to said wind instrument substantially parallel to said one of said parallel spaced apart tubes and its associated one of said pair of spaced apart straight portions, said bar having terminating end means to engage said slide member thereby limiting the extent of travel of said slide member.

3,933,080
PNEUMATIC ACTUATORS
Nicholas John Byrom Corrie, Camberley, England, assignor to Martonair Limited, Middlesex, England
Filed Sept. 7, 1972, Ser. No. 286,862
Claims priority, application United Kingdom, Sept. 14, 1971, 42763/71
Int. Cl.² F15B 15/22
U.S. Cl. 91—394 3 Claims

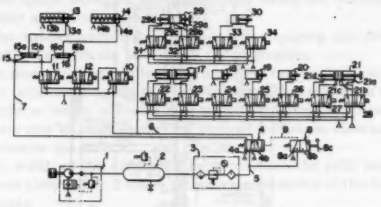


1. An actuator comprising a cylinder and a piston within said cylinder, a wall of said cylinder being stepped to define a region of reduced cross-section at one end of the cylinder, said piston also being stepped to define a boss provided at one end adjacent said region of reduced cross-section to be disposed within said region at one extremity of its range of possible movement within the cylinder, a first working chamber defined in said cylinder in said region, an inlet and exhaust passage in said chamber, an orifice in said passage and in communication with said first working chamber, and a pressure relief valve mounted in said passage and operable to control the size of said orifice so that upon a predetermined pressure being produced in said first working chamber said orifice has a fixed cross-sectional orifice exhausting said first working chamber whereby upon said predetermined pressure being produced the pressure in said first working chamber is dependant upon the velocity of said piston in said first working chamber, a second working chamber defined in said cylinder and separated and sealed from said first working chamber by said piston boss when said boss is located in said region to act as a cushion volume to limit the piston velocity, an exhaust passage in communication with said second working chamber, an exhaust valve in said exhaust passage, biasing means biasing said exhaust valve towards an open position, an outlet orifice in said exhaust passage closable by the exhaust valve, and a connecting passage communicating pressure from said first working chamber to said exhaust valve to operate said valve against the action of said biasing means and close said outlet orifice upon a predetermined pressure being produced in said first working chamber.

3,933,081
FLUID CONTROL CIRCUIT FOR A RADIO CONTROLLED VEHICLE
Hiroyuki Taki; Masanovu Ogura, both of Komatsu; Toru Tanabe, and Hidenori Mizuguchi, both of Kanazawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Apr. 17, 1974, Ser. No. 461,795
Int. Cl.² F15B 11/16, 13/06
U.S. Cl. 91—411 R 3 Claims

1. A fluid control circuit of a radio controlled vehicle for operating an engine, transmission, steering, movable elements of an earth-moving machine and braking devices of the vehicle by means of radio control, comprising a plurality of shuttle valves communicating at the output side thereof with a brake

cylinder; a first conduit means communicating with said shuttle valves at respective inlet port sides thereof; a circuit changing valve means communicating with a source of fluid under pressure through a second conduit means, said circuit changing valve means being interposed between said second conduit means and said first conduit means communicating with said shuttle valves; and a third conduit means communicating with operating cylinders for the engine, transmission, steering, movable elements of an earth-moving machine and braking devices of the vehicle through respective remotely controlled



solenoid operated valves for controlling said operating cylinders, said circuit changing valve means being manually operable between a first position for feeding fluid under pressure from said source to said first conduit means communicating with said shuttle valves and a second position for feeding fluid under pressure from said source to said third conduit means communicating with said operating cylinders through said solenoid operated valves, whereby said operating cylinders may be remotely controlled by the remote operation of said solenoid operated valves only when said circuit changing valve means is in said second position.

3,933,082

AXIAL PISTON TYPE MACHINE

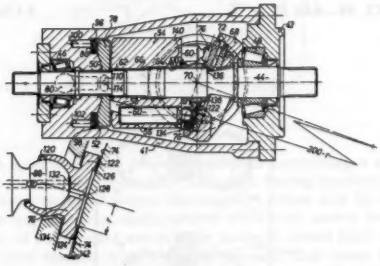
Hans Molly, Dr. Eugen-Essig-Str.48, 7502 Malsch/Krs. Karlsruhe, Germany

Filed Aug. 6, 1973, Ser. No. 385,838

Claims priority, application Germany, Aug. 16, 1972, 2240116; May 24, 1973, 2326435

Int. Cl.² F01B *1/06*

U.S. Cl. 91—485 **5 Claims**



1. In an axial piston machine comprising a casing having a portion about a primary axis with high and low pressure openings therein, a cylinder barrel journaled in the casing at two spaced points along its axis for axial and rotary motion about said primary axis with respect to the casing, said cylinder barrel having two ends with axial cylinder bores extending inwardly from one end and connecting passages extending from the cylinder bores to the other end, said other end being adjacent said portion, valving means for valving the flow of fluid to and from said cylinder bores, whereby with said rotation said passages communicate with said openings through said valving means, said valving means including said portion, said other end and an intermediate disc between the barrel and said portion of the casing, said disc having two sides with one side in contact with the casing and the other side in contact with said other end of the barrel, said sides having different centers of curvature, said other end of the barrel and said portion of the casing having shapes complementary to the respective side of the disc which they contact, and means for rendering said disc stationary with respect to said casing,

a stroke plate positioned adjacent said one end of the cylinder barrel, said stroke plate having an axis which is at an angle to the primary axis, and axial piston means having portions within said cylinder bores and portions contacting said stroke plate to produce a reciprocating movement thereof upon relative rotational movement between the cylinder barrel and the stroke plate, the improvement comprising:

said means for rendering said disc stationary including a retainer member, first guide means engaging said casing and said retainer member for guiding said retainer member relative to said casing in a first direction normal to said primary axis, second guide means engaging said retainer member and said intermediate disc for guiding said intermediate disc relative to said retainer member in a second direction normal to said first direction, said first and second guide means permitting movement of the intermediate disc in the direction of said primary axis and angular movements about axes parallel to said first and second directions.

3,933,083

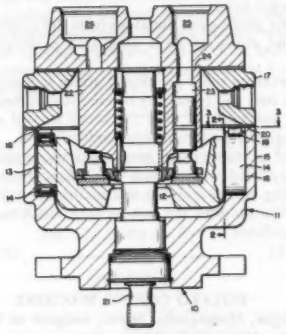
VARIABLE DISPLACEMENT CYLINDRICAL PUMP

Charles O. Weisenbach, Watertown, and Donald R. Schneckenburger, Chaumont, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,319

Int. Cl.² F01B *13/04*

U.S. Cl. 92—12.2 **9 Claims**



1. A variable displacement cylindrical pump comprising a sectional housing and a cam plate within the housing having trunnions and trunnion bearings wherein improved means for journalling the trunnions in a sectional housing comprises;

a. an integral first generally annular pump housing section having oppositely disposed recesses formed from one end thereof only in its inner periphery and not penetrating the outer periphery of the integral housing section for permitting the cam plate with its trunnions and trunnion bearings assembled thereon to be inserted within the first housing section from said one end with its bearings journalled in the recesses,

b. securing means including a second generally annular pump housing section adjoining the first housing section for securing the cam plate trunnions and trunnion bearings within the recesses, and

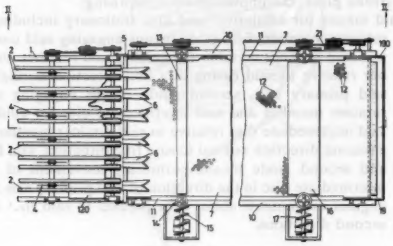
c. resilient means disposed between the second housing and each trunnion bearing for preventing vibration of the cam plate.

3,933,084

SQUEEZING-SHREDDING MACHINE FOR TOMATO PULP SUITABLE FOR CANNING IN THE RAW STATE

Gianfranco Dall'Argine, Via Bizzozzero No. 12, and Ermes Ghiretti, Via Bezzecca No. 3, both of Parma, Italy (43100)

Filed Nov. 18, 1974, Ser. No. 524,879
Claims priority, application Italy, Nov. 22, 1973, 46900/73
Int. Cl.² A23N 4/24
U.S. Cl. 99—538 9 Claims



1. Machine for squeezing and shredding tomatoes and the like which comprises in combination:

at least one pair of continuous parallel conveyor belts defining therebetween a channel for supporting and advancing tomatoes from an input to an output end,

a knife positioned between said belts to cut tomatoes advanced along said belts in half,

a perforated conveyor belt downstream of said parallel conveyor belts,

means for guiding cut tomatoes from the output end of said parallel conveyor belts onto said perforated conveyor belt,

a first pressure roller positioned above said perforated conveyor belt and resiliently biassed toward said belt with a force sufficient to urge the seeds in said cut tomatoes through the perforations in said belt, and

a second pressure roller positioned above said perforated conveyor belt downstream of said first pressure roller and pressing downwardly on said perforated belt with a force sufficient to drive the pulp of said tomatoes through said perforations.

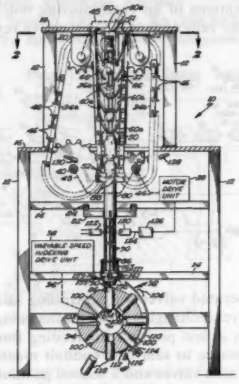
3,933,085

POTATO CORING MACHINE

Jack J. Rejsa, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 11, 1974, Ser. No. 449,815
Int. Cl.² A23N 3/04
U.S. Cl. 99—544 4 Claims

3. An apparatus for coring potatoes comprising a framework having a potato inlet, a coring knife mounted on the framework, a conveyor between the knife and the inlet, said conveyor including potato contacting members for engaging each potato to advance the potato on the framework towards the knife and force the potato through the plane of the knife whereby the knife removes a central core portion from each potato, a potato core holding wheel mounted in spaced relationship to the knife, said wheel having a plurality of radially extending pockets therein, a drive shaft supporting the wheel for rotation upon an axis at the junction of lines extending centrally from each pocket, a guide means between the knife and the wheel for guiding the potato cores from the knife to the outer open ends of the pockets extending through the wheel, each of the pockets through the wheel being open at its outer and inner ends, first and second stationary cutting blades at the inner and outer ends of the pockets respectively, a first stop mounted adjacent the inner ends of the pockets for supporting the potato with its inward end extending a predetermined distance beyond the inward end of each pocket when the pocket is rotated past the first cutting blade, drive



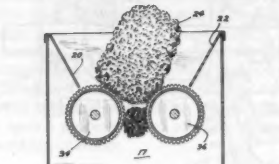
means connected to the wheel for rotating the wheel, a second fixed stop mounted radially outward from the wheel whereby the rotation of the wheel causes an outward shifting of each of the cores due to centrifugal force thereby throwing the potato cores outwardly against said second stop means so that the outer end of each potato core projects through the outer open end of each pocket in position to be removed by the second cutting blade.

3,933,086

APPARATUS FOR SEPARATING DRIED FRUIT AGGREGATES

Charles N. Standing, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 2, 1973, Ser. No. 385,006
Int. Cl.² B07B 13/00
U.S. Cl. 99—646 R 3 Claims



1. An apparatus for separating blocks of aggregated dried fruit into individual food pieces comprising:

a. a supporting framework,

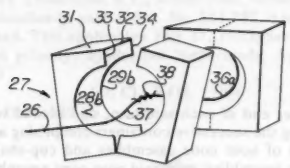
b. a pair of parallel deaggregating rolls mounted upon the framework,
c. the surfaces of both the deaggregating rolls being formed from rubber,
d. substantially uniformly spaced apart rubber projections over substantially the entire surface of each of the rolls of the pair,
e. the projections being integral with each of the roll surfaces,
f. the height and width of the projections being less than an inch,
g. the space between the projections being on the same order as the width thereof,
h. the rubber projections frictionally engaging the dried fruit pieces on the surface of the aggregate,
i. the deaggregating rolls being mounted on the framework for rotation in opposite directions such that points on the surfaces move toward one another and thereafter away from one another through a zone of minimum clearance between the rolls,
j. the width of the clearance zone between the rolls being from about 1/2 to 2 times the average diameter of the food pieces,
k. a drive means operatively connected to both of the rolls to impart rotation thereto in opposite directions and at different surface speeds such that a speed differential is established therebetween to provide a shearing action upon the fruit,
l. the blocks of aggregated fruit upon being placed on the rolls between the surfaces being thereby subjected to shear forces sufficient to reduce the aggregated blocks into individual fruit pieces as the rolls rotate thereby separating the fruit aggregate into individual fruit pieces without macerating or otherwise damaging the fruit pieces.

3,933,087

BALER WIRE CARTON AND SYSTEM

Manuel A. Mattos, 1424 Eucalyptus, Patterson, Calif. 95363

Continuation of Ser. No. 316,111, Dec. 18, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,451
Int. Cl.² B65B *13/18*
U.S. Cl. 100—1 **3 Claims**



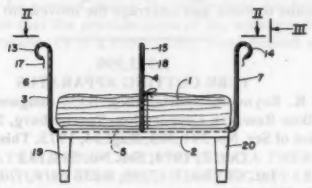
1. A system for the purpose described comprising a rack mounted on a baling machine, said rack having brackets for positioning first and second rectangular cartons side by side with a gap between said cartons, each said carton being formed of paperboard and initially having a closed front and back each formed with a central circular first score line adapted to be manually severed without the use of tools to form a cut out and four sides interconnecting said front and back, one said side comprising a top when said carton is installed in said rack, a coil of wire in each said carton having a leading and a trailing end, said leading end of said coil in said first carton extending out through the back cutout in said first carton, said leading end of said coil in said second carton extending out through the front cutout of said second carton and being spliced to said trailing end of said coil in said first carton, said cartons being insertable in and removable from said brackets, the top of each said carton initially being completely closed, each said top being formed with a second score line across said top and down said front and back to intersect said cutouts of said front and back, said carton being easily manually severable along said second score line without use of tools to lay open said top and permit removal of said carton from encirclement of wire.

3,933,088

NEWSPAPER AND MAGAZINE STORAGE DEVICE

Mary A. Pessagno, Fremont, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 3, 1974, Ser. No. 502,438
Int. Cl.² B65B *13/18*
U.S. Cl. 100—34 **2 Claims**



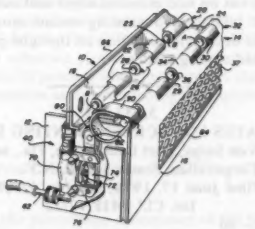
1. A newspaper and magazine storage device for storing and disposing of a plurality of newspapers and magazines, said storage device comprising
a substantially rectangular plate-like support member; and
a pair of tubular members affixed to the top of the support member and crossing each other on top of the support member at substantially right angles to each other, each tubular member extending along a corresponding axis of the support member and each tubular member having a substantially U-shaped configuration with a head part affixed to the support member and a pair of arms extending substantially perpendicularly from the ends of the head part and extending substantially perpendicularly to the plane of the support member, each of the tubular members having a slit formed therein along the length thereof for accommodating cord-like binding material in each of the tubular members, and each of the tubular members being curved at both its free ends in a substantially hook-like configuration.

3,933,089

SAFETY GUARD FOR PRESS

Robert E. Spooner, Chicago, Ill., assignor to Robert E. Spooner and Sylvia M. Spooner, both of Chicago, Ill.

Filed Feb. 13, 1975, Ser. No. 549,734
Int. Cl.² B30B *15/16*
U.S. Cl. 100—53 **13 Claims**



1. Safety apparatus for a press or the like having relatively movable dies defining an open area therebetween for receiving an article, comprising a gate;
primary pivot means on said gate defining a primary pivot axis adjacent said open area about which said gate is

movable from an open position to expose said open area to a closed position to shield said open area;

secondary pivot means defining a secondary pivot axis generally parallel to and spaced from said primary pivot axis;

normally closed switch means cooperating with said press;

said switch means being positioned to be opened by said gate when said gate is moved about said primary axis from said open position to said closed position and to allow said switch to close when moved about said primary axis from said closed position to said open position to interrupt the movement of said dies; and

said gate pivoting about said secondary pivot axis when an obstruction is aligned with said gate to allow said switch means to close and interrupt the movement of said dies.

3,933,090

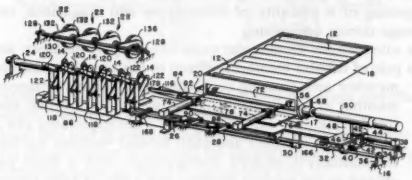
TUBE CUTTING APPARATUS

James R. Reynolds, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 391,303, Aug. 24, 1973. This application Oct. 2, 1974, Ser. No. 511,142

Int. Cl.² B41F *17/08;* **B23B** *5/14, 7/00*

U.S. Cl. 101—38 A **3 Claims**



1. A machine to automatically cut a larger tube into a smaller tube or tubes comprising: a frame, a mandrel rotably mounted on said frame, a platform slidably mounted on said frame, a plurality of cutter blades rotably mounted on said frame and operably associated with said mandrel, a tube storage tray mounted on said frame adjacent said platform, tube receiving means mounted on said frame receiving tubes from said tube storage tray, means mounted on said platform to deliver tubes from said tube receiving means, means operably associated with said tube storage tray to allow tubes to be delivered to said tube receiving means, means mounted on said platform to place a tube from said tube receiving means on said mandrel, means to slide said platform to place a tube on said mandrel, means to pivot said cutter blades into contact with the tube placed on said mandrel, control means to automatically pivot said cutter blades away from said mandrel and doff the tube cut on said mandrel when said cutter blades cut through said tube, and a printing means mounted on said frame to print desired information on the tube prior to cutting thereof by said cutting blades.

3,933,091

APPARATUS FOR SCREEN PRINTING BOTTLES

Henry Carl Von Saspe, Fort Lauderdale, Fla., assignor to New Products Corporation, Staten Island, N.Y.

Filed June 17, 1974, Ser. No. 479,988

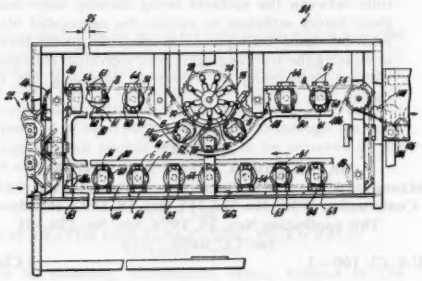
Int. Cl.² B41F *17/22*

U.S. Cl. 101—40 **24 Claims**

1. An in-line automatic and continuous container printer adapted to be positioned colinearly with and intermediate container production and container filling lines, said printer comprising:

a. a loading station including a first plurality of roller means, first endless belt means trained about said first roller means and first means for driving one of said first roller means for receiving and transporting a plurality of successive containers;

b. a printing station including a second plurality of roller means, a second pair of laterally spaced apart endless belt means trained thereabout and means for driving at least one of said second roller means for receiving successive containers from said loading station, said printing station further including stationary, arcuate screen means having an outer surface past which the containers are transported in tangential contact, a plurality of squeegees normally in tangential contact with the inner surface of said screen means for driving such squeegees over the inner surface of said screen means whereby a supply of ink passes through said screen means, said second roller means being positioned such that said second belt means are moved along a generally rectangular path, one of the longer legs of said rectangular path including an arcuate path portion, there being further included a shaft and additional roller means mounted on said shaft for maintaining the shape of said arcuate path portion, said arcuate screen means being coaxial with said arcuate path portion of said second belt means, there being still further included a plurality of arms extending radially from said shaft, one of said squeegees being mounted on the radially outer end of each said arm, said second means for receiving the successive containers comprising a plurality of pairs of nose cone assemblies and cup-shaped base member assemblies, each said nose cone assembly in said pair being coupled to one of said second belt means in said printing station, each said base assembly in said pair being secured to another one of said second belt means in said printing station and means for urging said nose cone assemblies toward said base member assemblies and into the open end of the containers;



c. means for rotating the containers about their own longitudinal axes during transport thereof past said screen means, said means for rotating the containers comprising a gear coaxial and integral with each said base member assembly and a cooperating, generally oblong rack that is at least partially congruent and coaxial with said second belt means in said printing station;

d. means for detecting the absence of a container in said printing station, said detecting means being positioned adjacent said screen means for preventing contact between selected ones of said squeegees and said screen means; and

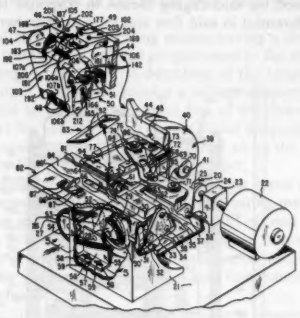
e. a drying station for receiving the containers after the printing thereof.

3,933,092

PRINTING APPARATUS

Raymond L. Kirby, Jr., Vandalia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 30, 1974, Ser. No. 537,630
Int. Cl.² B41J 27/12
U.S. Cl. 101—105 27 Claims



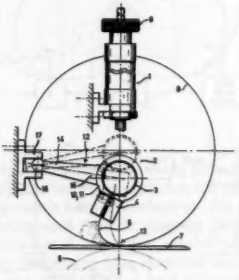
1. Printing apparatus, comprising: a platen, a print head cooperable with the platen, a feed finger, means for driving the feed finger in a forward direction from a home position to feed a web of record members to a printing position between the print head and the platen and for driving the feed finger in the return direction to the home position, an inker, means driven by the driving means for actuating the inker into and out of inking cooperation with the print head, and manually settable means for varying the stroke of the driving means to vary the travel of the feed finger, the actuating means including means to effect travel of the inker through the same distance irrespective of the stroke of the driving means as determined by the setting of the settable means.

3,933,093

ROTATION SCREEN PRINTING MACHINE AND SQUEEGEE DEVICE

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands

Continuation-in-part of Ser. No. 811,787, April 1, 1969, abandoned. This application July 27, 1973, Ser. No. 383,155
Claims priority, application Netherlands, Apr. 25, 1968, 6805845
Int. Cl.² B41L 13/04
U.S. Cl. 101—120 5 Claims



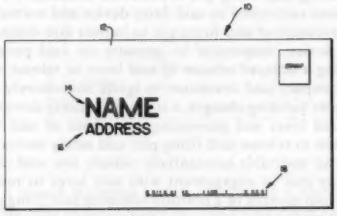
1. A rotary screen printing machine having a frame, supporting members for the ends of one or more cylindrical stencils and with suspension members mounted on the frame for a squeegee device disposed within the stencil and consisting of a squeegee holder with a fitting for a flexible squeegee blade, and with means for guiding the material to be printed; the improvement consisting in that the squeegee blade consists of a thin flexible metal strip, the thickness of which is less than 1% of the width of the portion of the strip which freely protrudes from the fitting, said squeegee holder being supported at least on one end by suspension members, and the squeegee blade with its fitting being supported by the squeegee holder at two spaced locations, the suspension members of each squeegee holder comprising means for adjusting the height of the squeegee blade within the stencil, and further comprising means connecting the squeegee holder with the frame and permitting displacement of the holder in a generally horizontal direction, parallel to the guiding direction of the material to be printed during the adjustment for height, in such manner that the pressure area of the squeegee blade is situated permanently in a substantially fixed desired zone of the stencil.

3,933,094

SUBSTRATE HAVING COLORED INDICIA THEREON FOR READ-OUT BY INFRARED SCANNING APPARATUS

Joseph M. Murphy, Wilbraham, and Robert E. Lafler, Charlton City, both of Mass., assignors to United States Envelope Company, Springfield, Mass.

Filed Nov. 19, 1973, Ser. No. 417,355
Int. Cl.² B07C 5/342; G06K 7/12; B65D 27/00
U.S. Cl. 101—426 6 Claims



1. A substrate having indicia thereon for read-out by infrared scanning apparatus and made by a method comprising the steps of providing a printing ink of a color which in combination with the substrate yields a Print Contrast Signal substantially less than 50 percent when measured in the range of 800 to 900 nanometers as determined by the equation

$$\text{Print Contrast Signal} = \frac{Rw - Rb}{Rw} \times 100$$

where Rw is the percentage reflectance of the unprinted substrate and Rb the percentage reflectance of the printed area, adding a pigment dispersion comprising Pigment Blue 27 — Color Index 77510 to said ink in quantity sufficient to increase said Print Contrast Signal to at least 50 percent when measured within said range, and imprinting said indicia on said substrate with said ink after said material has been added thereto.

3,933,095

DELAYED ACTION STRIKING DEVICE WHICH MAY BE UTILIZED FOR THE PRIMING OF DETONATORS

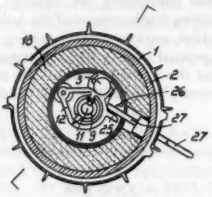
Federico Engeli, Lugano, Switzerland, assignor to Technical Arco Establishment-Schaan, Liechtenstein

Filed Jan. 14, 1974, Ser. No. 433,277

Claims priority, application Switzerland, Mar. 5, 1973, 3211/73

Int. Cl.² F42C 7/02

U.S. Cl. 102—70 R 2 Claims



1. A delayed action striking device for priming detonators of mines and the like, comprising, in combination, an outer casing; a pressure cap closing an end of said casing; a relatively stiff diaphragm seated in said casing and defining, with said pressure cap, an air chamber which is not closed airtight; an expansible lung in said casing in communication with said air chamber, and constituting a bursting delay device; two concentric annular bursting charges seated in said casing; a detonator seated centrally in the inner one of said bursting charges; a cylinder carried by said diaphragm in axial alignment with said detonator and spaced axially therefrom; a firing pin slidable in said cylinder; spring means in said cylinder biasing said firing pin toward said detonator; a displaceable lever controlled by said delay device and normally blocking movement of said firing pin to impact said detonator; said delay device, responsive to pressure on said pressure cap, effecting a delayed release of said lever to release said firing pin to impact said detonator to ignite successively the inner and outer bursting charges; a retractible safety device engaged with said lever and preventing movement of said lever in a direction to release said firing pin; said safety device comprising a rod insertable substantially radially into said casing with its inner end in engagement with said lever to restrain said lever from moving to a position releasing said firing pin; a first projection fixed on said casing and a second projection carried by said lever; said rod being engageable between said first and second projections to prevent movement of said lever in a direction to release said firing pin.

3,933,096

GYROSCOPIC RATE SWITCH

Howard W. Boothroyd, Amherst, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 11, 1974, Ser. No. 449,884

Int. Cl.² F42C 15/40; G01C 19/14

U.S. Cl. 102—70.2 R 6 Claims

1. A pneumatic gyroscopic rate switch for arming and safing a spinning missile which comprises:

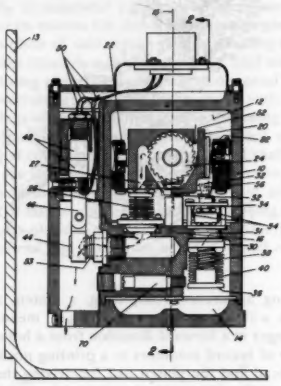
hermetically sealed housing means having an input axis axially aligned with the longitudinal axis of said missile, a transversely positioned common housing wall having a calibrated orifice therein dividing said housing means into a first and a second chamber, said first and second chambers containing a pressurized gas therein and communicating with each other through said calibrated orifice;

pneumatic valve means fixedly attached to said housing means for pressurizing said housing means;

pneumatic gyroscopic means rotatably supported by said housing means within said first chamber;

frangible exhaust means, operatively connected to said housing means, pneumatically communicating with and torsionally restraining said gyroscopic means;

pneumatic caging means operatively positioned in said housing means for caging and uncaging said gyroscopic means, having a pair of electrical interlock switches affixed to said caging means, said interlock switches being closed by said caging means in response to a pressure differential in said first and second chambers;



temperature compensating pneumatic by-pass valve means operatively positioned in said housing and communicating with said first chamber and said exhaust means, said valve means controlling the gas flow rate from said first chamber to said exhaust means as a function of temperature; and

an electrical switch operatively attached to said housing means and said gyroscopic means, said switch closing in response to the precessing motion of said gyroscopic means thereby arming said missile.

3,933,097

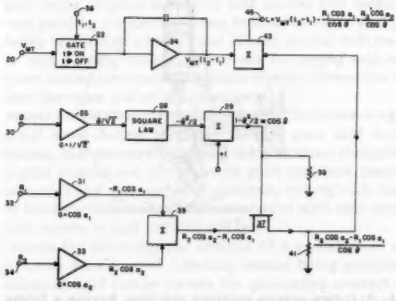
DEVICE TO DETERMINE EFFECTIVE TARGET SIZE FOR FIXED ANGLE FUZES

Louis J. Avila, Jr., Costa Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 4, 1968, Ser. No. 697,558

Int. Cl.² F42C 13/00

U.S. Cl. 102—70.2 P 2 Claims



1. A system for determining the effective target size in a guided missile-target encounter, the combination comprising:

a. gate circuit means having a first input adapted to receive a voltage representing the closing velocity between the missile and target, a second input adapted to receive gating pulses and having an output,

b. a first function generating means having an input adapted to receive a voltage proportional to the target long range line-of-sight angle and providing an output signal proportional to the cosine of the target long range line-of-sight angle,

c. a second function generating means having a first input adapted to receive a voltage proportional to the missile to target range upon the first detection of the target and a second input adapted to receive a voltage proportional to the missile to target range upon loss of the detection of the target for generating an output signal proportional to the difference in missile to target range along the relative trajectory between the missile and target,

d. signal adding circuit means having a first input coupled to the output of said first function generating means and a second input coupled to the output of said second function generating means for providing an output signal which is proportional to the difference in range signal divided by the output signal from said first function generating means,

e. summing circuit means having a first input coupled to the output of said signal adding circuit means and having a second input coupled to the output of said gate circuit means for providing an output signal proportional to the effective length of the target.

3,933,098

SOLID CYLINDRICAL CENTRIPETALLY BURNING PROPELLANT WITH FOUR CONVEX ARCED LOBES

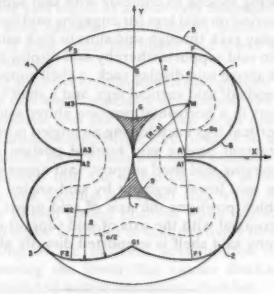
Pierre Louis Portalier, Sevres, France, assignor to Societe Nationale des Poudres et Explosifs, France

Continuation-in-part of Ser. No. 396,389, Sept. 12, 1973, abandoned. This application Mar. 11, 1974, Ser. No. 449,927

Claims priority, application France, Sept. 26, 1972, 72.33941

Int. Cl.² F42B 5/16

U.S. Cl. 102—99 **16 Claims**



1. A solid elongated externally burning propellant element, the external configuration being such that the element retains its general configuration during combustion, the configuration of the element being such that the element may be inscribed in a cylinder of radius R, the cross section of the element having a contour comprising four identical connected lobes, said element having a first and a second perpendicular planes of symmetry, said element exhibiting mirror-symmetry with respect to said first and a second perpendicular planes passing through the axis of said cylinder of radius R, each lobe comprising a convex arc of a circle of radius e whose center is at a distance $(R - e)$ from the axis of the cylinder, where e is the combustion thickness of the element, said arc being tangential to said cylinder, and each arc contains only one point at the minimum distance e from the axis of the cylinder, the four points of the arcs at said distance e being symmetrical with respect to the axis of the cylinder, the thickness of relative combustion e/R varying at a continuous rate during combustion, whereby the combustion of the element leaves only two combustion residues.

3,933,099

VEHICLE CONTROL APPARATUS FOR A CLOSED TRANSPORTING SYSTEM

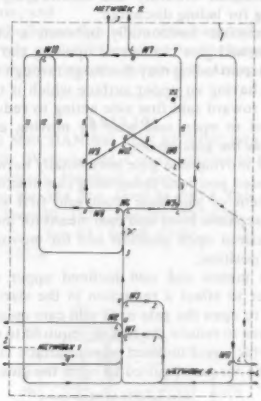
Sieb, Reinhard, Luneburg, Germany, assignor to H. Jungheinrich & Co., Germany

Continuation of Ser. No. 275,876, July 27, 1972, abandoned. This application Jan. 3, 1974, Ser. No. 430,404

Claims priority, application Germany, July 29, 1971, 2137864

Int. Cl.² B61J 3/00

U.S. Cl. 104—88 **28 Claims**

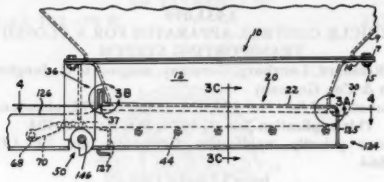


1. For a closed transport system comprising a plurality of routes, a plurality of route junctions which each allow a choice of two directions, and at least one vehicle arranged to travel along said routes, a control apparatus comprising: a transmitter associated with each said junction, each transmitter being adapted to transmit a particular coded signal indicating the direction to be taken at the associated junction to proceed towards various route segments; drive means on each of the one or more vehicles for moving each of the one or more vehicles; and a respective destination selection device on each of the one or more vehicles connected to control the drive means of such vehicle, each said device comprising: a store in which may be entered a code indicative of a destination route segment for the vehicle; a receiver for receiving the coded signal transmitted from the transmitter associated with an approaching junction; a comparator connected to the associated store and receiver for comparing said stored destination signal and said received signal; and control means responsive to the output of the associated comparator to select the direction to be taken by the associated vehicle at the junction each transmitter including sending means to send said coded signal in the form of a fixed series of signal elements each associated with a particular segment and destination marking together with any said signal element associated with a route segment which will be reached on leaving the associated junction, and on the vehicle said receiver and comparator including operating means to function with the same number of signal elements.

3,933,100
HOPPER GATE ACTUATING MECHANISM

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,209
Int. Cl.² B61D 7/20, 7/22, 7/26, 7/32
U.S. Cl. 105—282P 14 Claims



1. A gravity outlet comprising:

a pan having flange means for attachment to a hopper and sides inclined inwardly and downwardly to define an opening for lading discharge;

a gate movable horizontally between a closed position wherein said gate closes said opening and an open position wherein lading may discharge through said opening;

said gate having an upper surface which is inclined downwardly toward said first side acting to reduce the torque required to open said gate by moving away from the lading as the gate opens;

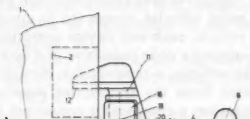
means for moving said gate horizontally between said open and closed positions comprising cam means for initiating movement of said gate from said first side, and drive means separate from said cam means for moving said gate to a desired open position and for moving said gate to closed position;

said cam means and said inclined upper surface acting together to effect a reduction in the starting torque required to open the gate until said cam means is no longer operative to reduce the torque required to open said gate, after which said inclined upper surface continues to reduce the torque required to open the gate.

3,933,101
ANCHORING MECHANISM FOR ANCHORING OF FREIGHT CONTAINERS

Günter Blas, Faistenhaar, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Aug. 5, 1974, Ser. No. 494,467
Claims priority, application Germany, Aug. 9, 1973, 2340315
Int. Cl.² B60P 7/08
U.S. Cl. 105—366 B 4 Claims



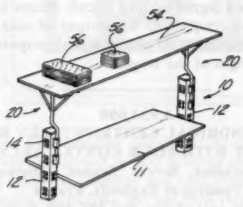
1. An anchoring mechanism having a pivotal hook for engaging and anchoring freight containers to flooring in an aircraft, comprising:

a two arm lever pivotally supported for movement about a first pivot axis having a bar secured to one arm and extending above the surface of said flooring, said bar having a pair of inclined contact faces for engaging a moving freight container, said moving freight container effecting a pivoting of said lever about said first pivot axis when said freight container engages said two arm lever, the other arm of said two arm lever being rotatably connected to a locking hook pivotally supported on said flooring for movement about a second pivot axis between positions above and below said surface of said flooring, said locking hook being pivotal in response to a pivoting movement of said two arm lever to effect a movement of said locking hook to a position below the surface of said flooring.

3,933,102
DISPLAY RACK EXTENSION

Frederick F. Brunette, 22804 Brookdale, Farmington, Mich. 48024

Filed Sept. 23, 1974, Ser. No. 508,230
Int. Cl.² A47B 3/00
U.S. Cl. 108—111 3 Claims



1. The combination of a display rack and a display rack extension, said display rack having spaced and vertical upright supports, said supports having a plurality of sides, at least one of said sides being provided with vertically spaced slots, said display rack extension comprising spaced and vertical legs, said legs being spaced to coincide with said supports, hooked portions carried on said legs for engaging said upright supports of said display rack through said slots to lock said display rack extension to said supports whereby said display rack extension is disposed above said display rack, a shelf support secured to the upper ends of said vertical legs, and a shelf carried by said shelf support in a horizontal position above said display rack and said vertical legs each having an angled portion providing a lower segment having said hooked portion and an upper segment carrying said shelf support, said upper segment being offset from said lower segment by said angled portion by an amount which positions the axis of said upper segment substantially co-axial with the axis of said support of said display rack whereby said shelf is supported directly above said supports.

3,933,103
SLUICE FOR COMBUSTION FURNACES AS ROTARY KILNS

Verner Johannes Mikkelsen, deceased, late of Kastrup, Denmark, by Aase Foght Mikkelsen, executrix, assignor to Aktieselskabet "Volund", Glostrup, Denmark

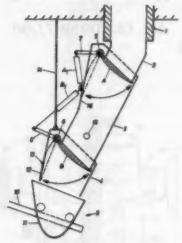
Filed Mar. 13, 1974, Ser. No. 450,805
Claims priority, application Denmark, Mar. 14, 1973, 1383/73
Int. Cl.² F23J 1/00
U.S. Cl. 110—165 R 20 Claims

1. An apparatus for removing burnt material such as clinker or uncombusted residual material and the like from a combustion furnace having means communicating with the furnace for discharging said material which comprises:

a. a duct attached to the discharge means and having a cross-section at least equal to that of the discharge means, said duct defining a sluice chamber therewithin and being oriented in a generally downward direction relative to a horizontal plane;

b. and upper flap rotatably mounted with respect to the upper end portion of the duct and having a first open position which exposes substantially the full cross-section of the duct to the discharge means and a second closed position in which the flap defines an upper wall portion of said sluice chamber;

c. a second flap rotatably mounted with respect to the lower end portion of the duct and having a first open position which exposes substantially the full cross-section of the lower portion of the duct and a second closed position in



which said second flap defines the lower wall of said sluice chamber; and

d. at least one nozzle mounted in a side wall of said duct between said upper and lower flaps and connected to a liquid supply means and capable of introducting a liquid into the sluice chamber at least at introducing minimum rate at least sufficient to contain dust in the sluice chamber and to maintain the nozzle in a relatively dust free condition at least when the lower flap is in a closed position and the upper flap is in an open position and material from the furnace is permitted to enter the sluice chamber, said nozzle and liquid supply means being capable of introducing said liquid at a relatively increased rate sufficient to cool material accumulated within the sluice chamber at least when the upper and lower flaps are in closed positions,

said flaps being selectively rotatable to said opened and closed positions such that simultaneously maintaining the lower flap in a closed position and the upper flap in an open position permits material discharged from the furnace to accumulate to a predetermined level within the sluice chamber while said liquid is introduced into the sluice chamber at least at said minimum rate and closing the upper flap while maintaining the lower flap in said closed position while introducing said liquid into said sluice chamber at said relatively increased rate provides cooling of the material accumulated therein and selectively opening the lower flap causes discharge of the material accumulated within the sluice chamber.

18. A method for operating a sluice system for removing hot material such as cement clinker from a furnace such as a rotary kiln or uncombusted or slag material and the like from a furnace through an ash pit communicating with a discharge opening of the furnace and having a steel plate duct having a cross-section at least equal to the cross-section of the ash pit, said duct being connected to the ash pit and positioned in a downward, relatively steeply slanted position, an upper rotatably mounted flap having an open position exposing substantially the full cross-section of the duct to the ash pit and a closed position at least substantially sealing communication between the duct and the ash pit and defining the upper wall of a sluicing chamber within the duct, a lower rotatably mounted flap having an open position exposing substantially the full cross-section of the lower end portion of the duct and having a closed position at least substantially sealing the lower end portion of the sluicing chamber within said duct and defining the lower wall of said sluicing chamber, nozzle means mounted in the side wall of the duct between said upper and lower flaps and connected to a water supply means and adapted for introducing water into said sluicing chamber defined within said duct comprising:

a. positioning a material receiving means in a material receiving position below the discharge end portion of the sluicing chamber;

b. closing the lower flap and opening the upper flap for a time period sufficient to permit a predetermined amount of said material from the ash pit to enter the sluicing chamber while simultaneously introducing water through said nozzle means and into said sluicing chamber at least at a minimum level sufficient to contain dust and to maintain the nozzle means in a dust free condition;

c. closing the upper flap and introducing water through said nozzle means at a rate greater than the rate of introduction of water utilized to contain the dust in the sluice chamber and sufficient to further cool the hot material in said sluicing chamber;

d. discontinuing the introduction of cooling water at said greater rate; and

e. opening the lower flap while simultaneously permitting the relatively cooled material to be discharged from the sluicing chamber into the material receiving means.

3,933,104

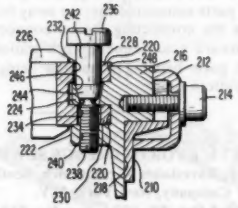
CUTTING MECHANISM FOR SEWING MACHINE

Edward A. Kelly, Wethersfield, Conn., assignor to The Merrow Machine Company, Hartford, Conn.

Division of Ser. No. 354,714, April 26, 1973. This application Dec. 30, 1974, Ser. No. 537,628

Int. Cl.² D05B 37/04

U.S. Cl. 112—121.2 **4 Claims**



1. A trimming mechanism for sewing machines including, in combination, an elongated oscillatory cutter arm supporting a movable cutting blade for movement in a fixed plane, a fixed cutter blade positioned to cooperate with said movable cutter blade to trim a workpiece on the machine, a flat end surface on said cutting arm, a groove formed in the flat end surface dividing the end portion of said cutting arm into a pair of parallel spaced flanges, a cutter mounting bracket for supporting said movable cutter blade mounted on the end portion of said cutter arm, said mounting bracket having a flat reference surface adapted to engage said flat end surface on said cutting arm to position said movable cutter blade, a flange on said mounting bracket extending outwardly from and perpendicular to said reference surface and projecting therefrom a distance slightly less than the depth of said groove, a screw fastener extending through and cooperating with the flanges on said cutter arm and said mounting bracket for rigidly mounting said mounting bracket on said cutter arm, and cooperating cam means on said screw fastener and said flange on said bracket operable to cam said flat end surface and said reference surface into firm surface-to-surface contact to accurately align said bracket on said cutter arm upon tightening said screw.

3,933,105

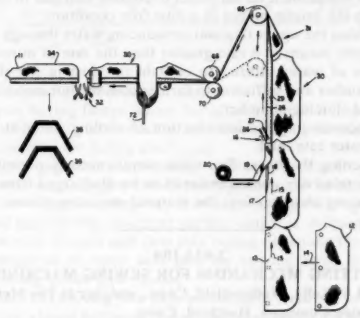
SHIRT FRONT ASSEMBLY, METHOD AND APPARATUS

Wade W. Frost, Vidalia, Ga. 30474, and William C. Sandlin, 708 1st National Bank, Waco, Tex. 76701

Continuation-in-part of Ser. No. 467,052, May 6, 1974, which is a continuation-in-part of Ser. No. 391,645, Aug. 27, 1973, Pat. No. 3,871,309, which is a division of Ser. No. 243,753, April 13, 1972, Pat. No. 3,780,682, which is a continuation-in-part of Ser. No. 79,031, Oct. 8, 1970, Pat. No. 3,675,604. This application Dec. 16, 1974, Ser. No. 532,960. The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.² D05B *19/00*

U.S. Cl. 112—121.29 3 Claims



1. Apparatus for forming shirt front assemblies or the like comprising connecting means for connecting together a connected series of center plait pattern parts and a series of shirt front pattern parts, and conveying means for conveying the connected series of center plait pattern parts with the shirt front pattern parts connected thereto away from the connecting means as the connecting means connects the parts together and toward a subsequent work station with the shirt front pattern parts hanging from and being moved by the center plait pattern parts.

3,933,106

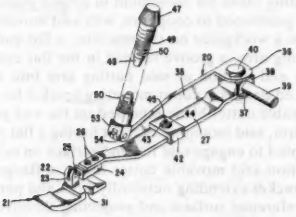
PRESSER DEVICE FOR OVEREDGE SEWING MACHINES

Ian S. Murray, Harestanes Kirkintilloch, Scotland, assignor to The Singer Company, New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,461

Int. Cl.² D05B *29/02*

U.S. Cl. 112—235 2 Claims



1. For an overedge sewing machine having a frame, a presser device comprising:

a presser bar arm having two ends, means pivotally supporting one end of said presser bar arm relatively to said frame on substantially horizontal and vertical pivots, means on the other of said ends for receiving a force for depressing said presser bar arm,

a leaf spring located substantially parallel to said presser bar arm and having two extremities, means supporting one extremity of said leaf spring together with said presser bar arm for pivotal motion therewith, a presser foot carried at the other extremity of said leaf spring, and

a lateral projection formed on said presser bar arm extending over and contacting a portion of said leaf spring intermediate the leaf spring extremities.

3,933,107

SEWING MACHINES

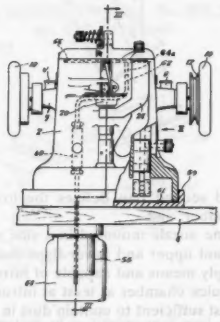
Philip Henri Davies, deceased, late of Brightlingsea, England, by Bessie Snowden Davies, executrix, assignors to Allbook & Hashfield Holdings Limited, London, England

Filed Apr. 17, 1974, Ser. No. 461,507

Claims priority, application United Kingdom, Apr. 19, 1973, 19148/73

Int. Cl.² D05B *71/00*

U.S. Cl. 112—256 8 Claims



1. In a sewing machine comprising a sewing mechanism and feed members for progressing the material to be sewn and means for relative displacement of said members between their operative position and an inoperative position for the insertion and removal of the material, the improved lubrication means consisting essentially of a reservoir of lubricating fluid, a pump having inlet means communicating with said reservoir and outlet means separate and operatively independent from said inlet means leading to at least one lubrication location in the machine, an actuating member of the pump operatively connected with at least one of said feed members for displacement in synchronism with the relative displacement of the feed members whereby the supply of lubricating fluid to said at least one location is controlled by the relative movements of said members between their operative and inoperative positions.

3,933,108

BUOYANT RISER SYSTEM

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Filed Sept. 3, 1974, Ser. No. 502,280

Int. Cl.² B63B *35/00*

U.S. Cl. 114—.5 D 5 Claims

1. An offshore oil well buoyant riser system adapted to extend from an offshore drilling platform to a subsea wellhead for encasing a drill string, wherein at least one riser section comprises:

a cylindrical riser pipe for enclosing a portion of the drill string;

a plurality of mounting rings mounted on said riser pipe, each of said rings being longitudinally spaced along said riser pipe with respect to another of said rings to form an annular recess on said riser pipe;

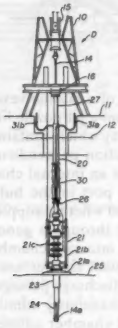
an annular gasket positioned in said annular mounting recess on said riser pipe, said gasket preventing galvanic corrosion and including an annular gasket recess therein positioned inwardly with respect to said spaced mounting rings;

a plurality of elongated, hollow, closed tanks having a gaseous fluid therein;

a pair of semi-cylindrical mounting plates having said tanks mounted therein;

choke and kill mounting plates mounted on said riser pipe to secure choke and kill lines about said riser pipe;

semi-circular openings formed in each of said semi-cylindrical mounting plates for receiving choke and kill lines therethrough;



an internal, semicircular mounting edge on each of said semi-cylindrical mounting plates, said internal, semi-circular mounting edges being mounted into said gasket recesses and being supported by said mounting rings;

lug end portions on each of said semi-cylindrical mounting plates for lining said plates and receiving bolt connectors for securing said plates onto said riser pipe;

said pair of semi-cylindrical plates extending circumferentially around said riser pipe for mounting said tanks circumferentially about said riser pipe with said tanks extending parallel to the longitudinal axis of said riser pipe whereby said tanks cooperate to create sufficient buoyant force in the water to substantially contribute to the application of tensile forces on said riser system.

3,933,109
BUOY RELEASABLE FROM A SUBMARINE

Gerard M. Boisrayon, Ollioules; Gilbert M. Martin, La Seyne, and Gabriel M. Delfosse, La Garde, all of France, assignors to Etat Francais, Paris, France

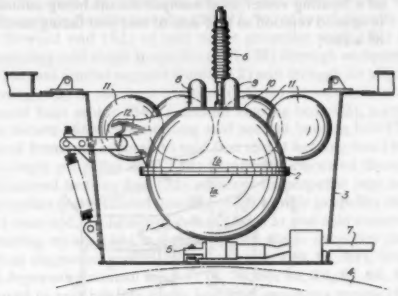
Filed Nov. 29, 1973, Ser. No. 420,161

Claims priority, application France, Nov. 30, 1972, 72.42521

Int. Cl.² B63G *8/00*

U.S. Cl. 114—16.5 **3 Claims**

1. A distress buoy for a submarine adapted to be mounted in an open recess in the top of a structure on the outside of the hull of the submarine, and adapted to be released to float freely at the surface of the water, said buoy comprising a hollow central spherical body containing at least one electrical power source and signal generator means connected to said source, a ring of auxiliary solid float members, and means fixing said ring of float members to said central spherical body at the upper portion thereof, said float members being fixed to said body to be disposed against the same so that said auxiliary float members are closely bound to follow all the movements of said central spherical body, said auxiliary float members being constituted of spherical blocks of cellular material having diametral bores, said means for fixing the float members to said body comprising mounting plates fixed to the upper portion of said spherical body between adjacent auxiliary floats and shafts mounted in said bores and fixed to said



plates, said mounting plates being fixed to the upper portion of said spherical body in diametral planes of said spherical body.

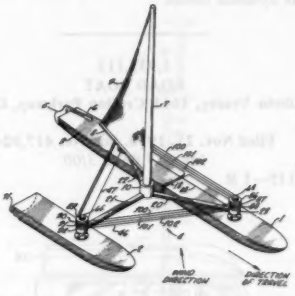
3,933,110
PLURAL-HULL SAILING CRAFT AND METHODS FOR SAILING CRAFT

Robert S. Jamieson, General Delivery, Corozal Town (Belize)

Filed Apr. 1, 1974, Ser. No. 456,846

Int. Cl.² B63B *1/10*

U.S. Cl. 114—39 **28 Claims**



1. A plural-hull craft comprising:

a. port and starboard hulls,

b. means for interconnecting said port and starboard hulls in laterally-separated relationship relative to each other,

c. means for changing the relative buoyancy of said port and starboard hulls to establish a condition of relatively greater buoyancy of that one of said hulls which is to the leeward, and

d. means for maintaining said condition of relatively greater buoyancy of the leeward hull independent of the course of said craft relative to the wind.

3,933,111
DOCK BUMPER UNIT

Robert J. von Bose, Arlington, and Darrell D. Dial, Fort Worth, both of Tex., assignors to Oil States Rubber Company, Arlington, Tex.

Filed Mar. 22, 1974, Ser. No. 453,853

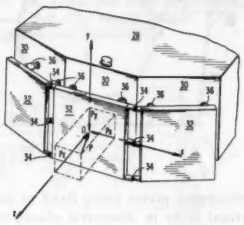
Int. Cl.² B63B *59/02*

U.S. Cl. 114—219 **12 Claims**

1. A marine docking fender, for dissipating the energy of dynamic forces exerted by a floating vessel against a pier

having at least one generally vertical side facing a body of water, said docking fender comprising:

a. bumper means for receiving dynamic forces from the hull of a floating vessel, said bumper means being connected in spaced relation to said side of said pier facing said body of water;



b. at least one compressible self-restoring cushioning means, extending orthogonally between and connecting said bumper means and said pier, for dissipating the dynamic forces; and

c. diagonal, vertically inclined countering means for exerting tensile forces upon said bumper means to rigidly restrain said bumper means against lateral displacement relative to said pier in response to the lateral components of the dynamic forces.

3,933,112

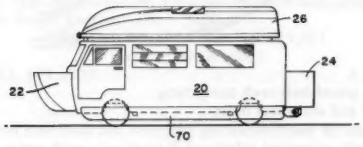
ROAD BOAT

Sidney Edwin Veazey, 1611 Crofton Parkway, Crofton, Md. 21113

Filed Nov. 21, 1973, Ser. No. 417,924

Int. Cl.² B60F *3/00*

U.S. Cl. 115—1 R **1 Claim**



1. A vehicle adapted for use on dry land or in water comprising a van type vehicle comprising a body; drive means; sealing means attached to the lower sections of said body forming a bow and stern structure and maintaining said vehicle watertight; flotation means attached to said body and a roof structure including a boat which conforms to the upper section of said body providing a seal therebetween, said roof structure further including means for securing said boat to the body of said vehicle and dismounting means for removal of said boat from said vehicle wherein said dismounting means includes a ball and socket respectively attached to said boat and said vehicle; a threaded bolt attached to said ball; a threaded cylinder adapted to receive said threaded bolt, said threaded cylinder including a nut at its closed end, actuation of which lowers and raises said threaded bolt and ball attached thereto.

3,933,113

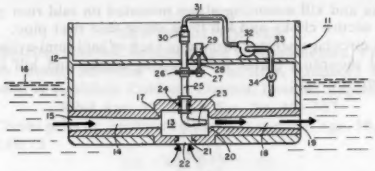
MARINE VESSEL PROPULSION SYSTEM

Henry E. Dornak, Jr., Alvin, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 293,284, Sept. 28, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,609

Int. Cl.² B63H *11/00*

U.S. Cl. 115—12 R **8 Claims**



6. In the propulsion of a marine vessel wherein a stream of water is discharged from a jet nozzle into a generally horizontal discharge passageway which contains a venturi constriction and extends in a direction perpendicular to the longitudinal axis of said vessel from an internal chamber surrounding said nozzle to a discharge port in the hull of the vessel for the generation of thrust and wherein supplemental water is admitted into said chamber through a generally horizontal intake passageway extending into said chamber from an intake port in the hull of said vessel to increase the amount of water expelled through said discharge passageway, the improvement which comprises simultaneously admitting additional supplemental water into said chamber adjacent said nozzle through a bottom intake passageway extending upwardly into said chamber beneath the nozzle from a bottom intake port in the hull of the vessel.

3,933,114

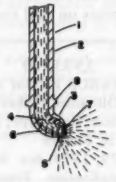
SELF-PURGING TELL-TALE NOZZLE

Norman E. Horn, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 385,821, Aug. 6, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,918

Int. Cl.² B63H *21/26*

U.S. Cl. 115—17 **5 Claims**



1. A marine outboard motor including a powerhead, a cowling enclosing said powerhead, a cooling water jacket generally surrounding said powerhead, water pump means driven by said motor and responsive to the operating speed thereof for supplying said water jacket with cooling water under pressure, and a tell-tale overboard water discharge line, characterized by; a self-purging overboard discharge nozzle for said tell-tale line, said nozzle comprising a self-supporting unbroken conical wall of soft resilient material defining a conical passage tapering in cross section from a wide end to an annular orifice, said conical wall diminishing in thickness from the wide end of said conical passage to said orifice, said wall being sufficiently rigid to maintain the shape and size of said orifice under operating conditions of selected maximum free water flow through said orifice at full engine and water pump speed, and said wall being sufficiently resilient to enable said conical passage to be automatically expanded by the

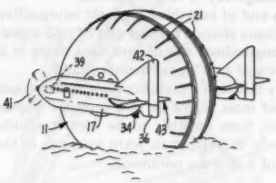
water pressure output of said water pump when said engine is near idle speed and said orifice is blocked to a diameter substantially equal to that of said tell-tale overboard discharge line so as to permit the blocking matter to pass therethrough.

3,933,115

SPHERICAL ROLLING HULL MARINE VESSEL

Alessandro O. Dandini, 101 Greenridge Drive, Reno, Nev. 89502

Filed Feb. 8, 1974, Ser. No. 440,793
Int. Cl.² B63H 1/38
U.S. Cl. 115—19 4 Claims



1. A marine vessel for rapidly transporting passengers and cargo, comprising

a spherical hull,

a hollow shaft means rotatably mounted in the horizontal poles of said spherical hull,

a frame assembly rigidly fixed to said shaft means in the interior of said sphere,

a propulsion means carried by said frame assembly and operatively connected to the interior of said spherical hull to effect rotation thereof,

elongated enclosed cabins mounted to said shaft means exteriorly of said hull,

said hollow shaft means providing a passageway formed to communicate through said hull between said frame assembly and said cabins,

said cabins being buoyant and seaworthy, and

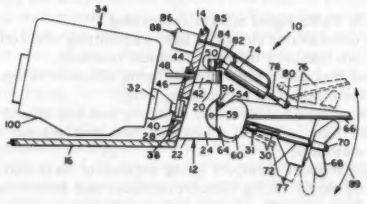
selectively detachable coupling means on said shaft for instantaneous decoupling of the cabins therefrom.

3,933,116

UNITARY PROPELLING AND STEERING ASSEMBLY FOR A POWER BOAT

Thomas F. Adams, Hallandale; Douglas W. Janisch, and William L. Sirois, both of Fort Lauderdale, all of Fla., assignors to Thomas F. Adams, Hollandale; Douglas W. Janisch and William L. Sirois, both of Fort Lauderdale, Fla.

Filed Dec. 2, 1974, Ser. No. 528,946
Int. Cl.² B63H 24/42
U.S. Cl. 115—35 15 Claims



1. A unitary direct in-line propelling and steering assembly (10) for an inboard motor (34) of a power boat, said assembly comprising a gimbal support frame (12) to be secured externally to the boat wall or transom (14), a vertically extending gimbal ring (54), pivot shaft means (50, 58) vertically pivoting said ring (54) in said gimbal support frame (12), a propeller shaft thrust bearing box (60), means for pivoting said thrust bearing box (60) on horizontal pivot means (59), in said vertical gimbal ring (54) for vertically swinging said thrust bearing box (60) in said gimbal ring (54), a single propeller shaft (30) journaled through said thrust bearing box (60), a single flexible coupler (90, 92, 94) secured directly on the forward end (62) of said single propeller shaft (30) for connecting said single propeller shaft (30) through an opening (26) in said gimbal support frame (12) and through an aligned opening (28) in the boat transom (14) for connection to the inboard boat motor (34), a second bearing box (72), a common means (66) for mounting said second bearing box (72) spaced from and secured to said first thrust bearing box (60), said single propeller shaft (30) being also journaled through said second bearing box (72) adjacent its propeller rear end, a propeller (68) secured directly on said single propeller shaft (30) rear end, said bearing boxes (60, 72) and said common mounting means (66) maintaining said single propeller shaft (30) in alignment with said single coupler (90, 92, 94), lifting and depressing control means (74, 78, 80, 82, 84, 85, 86, 88) secured to said bearing boxes common mounting means (66) for vertically swinging said single propeller shaft (30), and a tiller (48) secured to said gimbal ring pivot shaft (50) for horizontally swinging said bearing boxes (60, 72), said common mounting means (66), and said single propeller shaft (30) journaled therethrough.

3,933,117

VEHICLE DISTRESS WARNING DEVICE

Peter J. Maietta, 609 E. Wheelock Parkway, St. Paul, Minn. 55101

Filed Nov. 4, 1974, Ser. No. 520,261
Int. Cl.² B60Q 1/26
U.S. Cl. 116—28 R 1 Claim

1. A distress warning device intended for use on vehicles and the like, the device comprising, in combination:

a suction base member consisting of a flat disc shaped top member having an exterior surface, an interior surface, and peripheral circular cylindrical side wall surfaces; cylindrical side wall surfaces; cylindrical side walls depending downwardly from said side edges of said top member and defining an annular ridge surrounding said interior surface; a hollow chamber defined between said annular ridge and said interior surface of said top member and opening out of a base of said suction base member as defined between surrounding bottom edges of said annular ridge; said chamber adapted to have its base portion disposed in confronting relationship with a surface of the vehicle onto which said suction cup member is to be affixed with said bottom edges of said annular ridge engaging said surface; depressing centrally of said exterior surface in a direction inwardly of said chamber expels air from said chamber to create a partial vacuum therein thus

detachably mounting said suction cup base member to said surface against which it is applied;

a ringed shaped boss member affixed centrally of said base member exterior surface and extending axially upwardly therefrom and defining a socket therein opening out of a top end thereof;

a hollow cylindrically shaped signal member including cylindrical side walls, a hemi-spherical dome shaped top end surface, and a hemi-spherical dome shaped bottom end surface;

said signal member having an exterior surface extending completely over the side walls and top and bottom ends;

a vivid irridescent color applied completely over the exterior surface of said signal member, said color having high light reflective characteristics providing a high level of visibility both during the daylight hours as well as when illuminated during nighttime hours by light rays falling thereon, such as encountered by headlights of passing vehicles;

a first mast segment consisting of an axially elongated tubular body member having cylindrical side walls, a closed bottom end, an open top end, and a passageway extending axially therethrough opening out of said top end;

a slot extending longitudinally through said side wall of said first segment in communication with said passageway and extending from a position spaced inwardly of said bottom end to a position spaced inwardly of said top end;

a second passageway disposed in said first segment side wall extending normal to said first passageway about a short portion of the circumference of said side wall and parallel to said top end, said second passageway having one end in communication with said first passageway, said first and second passageways each having an identical width;

said bottom end of said first segment being affixed in said socket of said suction cup base member with said first segment projecting vertically outwardly therefrom;

a second mast segment consisting of an axially elongated tubular configuration having cylindrical side walls, a bottom end, a top end, and a passageway extending axially therethrough and opening out of the top end thereof;

the exterior diameter of said second segment being less than the diameter of said first segment passageway with the bottom end portion of said second segment being telescopically received in the top end of said first segment, said second segment being reciprocally movable axially relative to said first segment between a collapsed position disposed inwardly of said first segment and a telescopically extended position extending outwardly of said first segment;

a rod shaped pin member extending radially from said second segment side walls adjacent said bottom end thereof and having a diameter to be slidingly received in said first and second passageways of said first segment for guiding the movement of said second segment relative to said first segment;

a first slot extending longitudinally through said second segment side wall in communication with said passageway therein and extending from a position spaced inwardly of said top end to a position spaced inwardly of said bottom end;

a second slot disposed in said side wall extending normal to said first slot and having one end in communication with said first slot, the second slot extending about a short portion of the circumference of said second segment side wall and parallel to said top end thereof, said second slot being of the same width as said first slot;

a third mast segment being of an axially elongated tubular configuration and consisting of cylindrical side walls, a bottom end, and a top end;

said third segment having an exterior diameter of said cylindrical side walls less than the interior diameter of said second segment passageway with said bottom end of said third segment being telescopically received through said top end of said second segment and movable axially relative thereto between a collapsed position inwardly of said second segment and an extended position extending telescopically outwardly of said second segment;

a rod shaped pin member extending radially outwardly from said third segment cylindrical side wall adjacent said third segment bottom end and having a diameter to be slidingly received in said first and second slots of said second segment for guiding the movement of said third segment relative to said second segment;

said pin members of said third segment and second segment retaining said telescopically extending positions of said segments relative to their respective segments when said pin members are received in said second mentioned slot or passageway of said segments;

said top end of said third segment being affixed centrally of said dome shaped bottom end of said signal member with the longitudinal axis of said mast being in alignment with the axis of said signal member; and

whereby said signal member may be telescopically extended by said mast segments to a distance disposed above said section base member to be clearly visible at a lengthy distance therefrom to warn vehicles in the surrounding area of a distress condition.

3,933,118

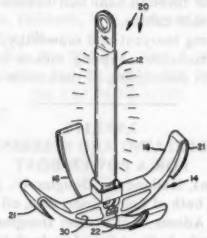
CHEMILUMINESCENT SIGNAL DEVICE

John H. Lyons, Ridgecrest; Steven M. Little, China Lake, both of Calif., and Vincent J. Esposito, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1974, Ser. No. 454,878

Int. Cl.[2] E01F *09/10*; H05B *33/00*

U.S. Cl. 116—63 P **5 Claims**



1. A traffic signal marker comprising:

an unbreakable elongated light transmitting tube containing two manually miscible chemical reactants;

said reactants, when mixed, being effective to emit light from said light transmitting tube;

a base member securedly receiving one end of said tube;

said base member comprising first and second support members;

said support members being arcuate in form and having upwardly facing concave surfaces and bottom surfaces for contacting a horizontal surface; and

each said support member having upturned peripheral ends with attached resilient downwardly projecting outboard stabilizing prongs, said bottom surfaces and said stabilizing prongs coacting to contact a supporting surface at approximately right angles thereto and to maintain the light tube in an upright position when the signal marker is deployed on the horizontal surface.

3,933,119

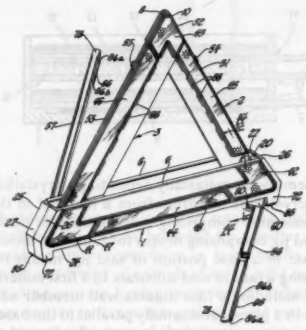
TRIANGULAR SIGNALLING DEVICE

Peter Hedgewick, Windsor, and Stewart H. Birrell, Clarkson, both of Canada, assignors to Reflex Corporation of Canada Limited, Windsor, Canada

Continuation of Ser. No. 273,250, July 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 196,428, Nov. 8, 1971, abandoned, and a continuation-in-part of Ser. No. 163,734, July 19, 1971, abandoned. This application July 12, 1974, Ser. No. 488,081

Int. Cl.[2] E01F *9/10*

U.S. Cl. 116—63 P 33 Claims



1. A foldable triangular traffic signalling device comprising: a collapsible body having first, second and third leg members connected together for movement between an erect triangle forming position in which each leg member constitutes one leg of a triangle and a folded position; said first leg member having a pair of spaced side wall members; said second and third leg members each having an inner end and an outer end with said inner ends being received in the space between said side wall members and pivotally connected at spaced locations to said side wall members such that each of said second and third leg members is pivotally movable with respect to said first leg member and projects angularly from said first leg member in said erect position and is received in the space between said side wall members in said folded position; interengaging means near said outer ends of said second and third leg members for detachably securing said outer ends together in said erect position; light reflective means on at least one outer surface of each of said leg members; said first leg member comprising a pair of complementary shell members secured together to form an enclosure for receiving said second and third leg members in the folded position, each of said side wall members defining a side wall of one of said shell members; said shell members each further including end wall members projecting inwardly from the opposite end edges of the associated side wall member, and a bottom wall member projecting inwardly from the bottom edge of the associated side wall member; one of said shell members being formed with inwardly projecting tapered pins and the other of said shell members being formed with complementary tubular guide members receiving said pins; including support means mounted on said first leg member for movement between an active position to support said leg members upright in their erect position and an inactive stored position, said support means including a pair of support arms each having its inner end pivotally connected to said first leg member such that each support arm is pivotally movable with respect to said first leg member between an extended active position and a retracted, inactive position, said support means further including locking means engaged between said support arms and said first leg member for restraining said support arms against movement from their active positions, said locking means comprising grooves and projections on said support arms and first leg member, said projections being resiliently received in the respective grooves when the respective support arms are in the extended position.

3,933,120

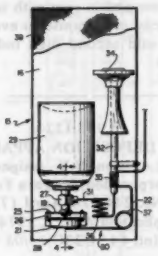
ALARM FOR DEEP FREEZER

Murrell W. Ollis, 125 Sunnybrook Drive, Bristol, Tenn. 37620

Filed Apr. 24, 1975, Ser. No. 571,334

Int. Cl.[2] F25B *49/00*

U.S. Cl. 116—103 9 Claims



9. A self-contained alarm for intermittently operating a signal when the temperature within a freezer rises to a predetermined value, said alarm comprising a remote bulb element having first and second connected portions, said first portion including means responsive to said freezer temperature, said second portion including means located exteriorly of said freezer, a source of expansible fluid having valve means operatively associated with said second portion of said remote bulb element, expansion means communicating with said valve means, said connecting means of said remote bulb element having portions located adjacent to said expansion means, and signal means operated by fluid within said expansion means, whereby an increase in pressure in said remote bulb element caused by a rise in temperature within the freezer opens the valve means of said source of fluid to discharge fluid into said expansion means where the fluid operates said signal and the fluid absorbs heat from said remote bulb element to reduce the pressure therein and close the valve means of said source of fluid to interrupt the flow of fluid therefrom.

3,933,121

TV CHANNEL NUMBER INDICATOR

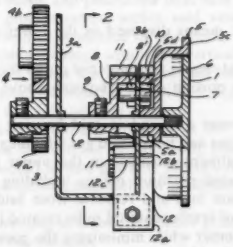
Akira Otsuki, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed June 6, 1973, Ser. No. 367,372

Claims priority, application Japan, June 24, 1972, 47-74547

Int. Cl.[2] H03J *1/02*

U.S. Cl. 116—124.2 R 10 Claims



1. A TV channel number indicator for use with a TV tuner, said indicator comprising a frame, a drive shaft mounted on

said frame, means for drivingly connecting said shaft to a TV tuner, a first digit indicator operatively connected to said drive shaft so as to be rotated thereby, a second digit indicator rotatably disposed on said frame concentric with said first digit indicator, a first external intermittent locking cam operatively connected to said drive shaft and having a first internal gear consisting of at least one isolated gear tooth secured to said first digit indicator, a second external intermittent locking cam with a second internal gear secured to said second digit indicating plate, spring means mounted on said frame and resiliently engaging said first and second cams to permit intermittent locking rotation action of said cams, and gear means mounted on said frame and in gear with said first and second internal gears, whereby in response to every rotation of said first digit indicator said second digit indicator is rotated a predetermined angle.

3,933,122

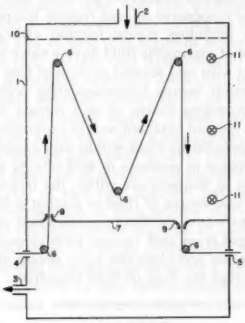
VAPOR DEPOSITION APPARATUS

George M. Wagner, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 244,574, April 17, 1972, Pat. No. 3,846,155. This application Aug. 1, 1974, Ser. No. 493,815

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49 **4 Claims**



1. An apparatus for the gaseous ammonia polymerization of resin on cellulosic textile materials which comprises:

a housing;

a gas inlet means disposed in the upper portion of said housing;

a gas outlet means disposed in the lower portion of said housing;

material inlet means and material outlet means disposed in the lower portion of said housing above said gas outlet means;

partition means disposed in said housing above said gas outlet means and below said gas inlet means so as to form a gas treatment chamber in the upper portion of said housing, said partition means including means for the introduction into and removal from said gas treatment chamber of textile material to be treated in said gas treatment chamber while minimizing the passage of gas into and out of said gas treatment chamber; and

means disposed in said gas treatment chamber for supporting textile material to be treated, said support means being disposed below said gas inlet means.

3,933,123

LIQUID PHASE EPITAXY

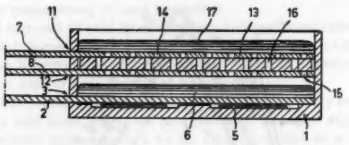
Elie Andre, Herouville Saint-Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 421,045, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 270,281, July 10, 1972, abandoned. This application Dec. 19, 1974, Ser. No. 535,045

Claims priority, application France, July 13, 1971, 71.25739

Int. Cl.² B05C *11/12*; H01L *7/38*

U.S. Cl. 118—421 **4 Claims**



1. An assembly for epitaxially depositing a crystallized layer on a monocrystalline substrate from a material in the liquid state, said assembly comprising a jig suitable for heating by a furnace, said jig comprising means for holding a monocrystalline substrate in a base portion of said jig, means for selectively exposing a face of said substrate to a first material in the liquid state including a first slidable wall member adapted to reciprocate in a plane substantially parallel to the base portion of the jig so as to control the exposure of a face of said substrate to a first material in the liquid state held in said jig above said substrate by said first slidable wall portion and side wall portions of said jig contiguous with said first slidable wall portion, said jig further comprising at least two additional wall members at least one of which is apertured and at least one of which is slidable and adapted to reciprocate in a plane substantially parallel to the base portion of said jig said additional wall members being positioned above said first material in the liquid state and below a second material in the liquid state and adapted by slidable movement of said additional wall members relative to each other of controlling the access of said second material in the liquid state to said first material in the liquid state through the apertures in said additional wall members to thereby control the flow of said second material in said liquid state into said first material in said liquid state.

3,933,124

ARTIFICIAL HABITATS

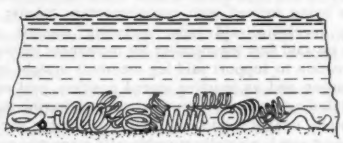
Claude Ledoux, Massy; Pierre Raoul, Epinay-Orge, and Jean-Claude Thomas, Neuilly-Seine, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed May 31, 1974, Ser. No. 454,236

Claims priority, application France, Mar. 26, 1973.

Int. Cl.² A01K *61/00*

U.S. Cl. 119—2 **14 Claims**



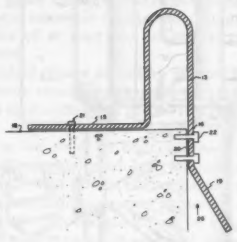
1. An artificial habitat for rearing aquatic fauna, which comprises a plurality of structures deposited on the bed of a body of water, the structures comprising longitudinal elongate helicoidal members of thermoplastic material having a density from 1.2 to 2 g/cm³

3,933,125

BEDDING RETAINER

Adrian Veldman, St. Pauls, Canada, assignor to Wildwood Farm Services International Inc., St. Pauls, Canada

Filed Feb. 14, 1974, Ser. No. 442,423
Claims priority, application Canada, Apr. 27, 1973, 169764
Int. Cl.² A01J 1/00
U.S. Cl. 119—28 3 Claims



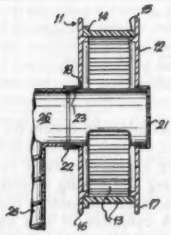
1. A bedding retainer for use in retaining bedding in an animal stall having a floor bounded by a gutter wall and a gutter, said retainer comprising a horizontally elongated, upright portion formed of a single sheet of rigid material with the upstanding portion having an inverted U shape in transverse cross section; a flange integral with and extending laterally from one upright arm of the upright portion to form an extending surface by which the stall area is expanded, a skirt depending from the other upright arm of the upright portion to a point below the level of said flange and defining between the skirt and the gutter wall a plenum, said skirt portion being appropriately bent or disposed so as to come into close proximity with the wall of the gutter and having means disposed along the skirt below the level of the flange for securing the depending skirt to the gutter wall whereby additional structural support is given to the upright portion.

3,933,126

ANIMAL EXERCISE DEVICE

Richard A. Gordon, 95 W. Third St., Freeport, N.Y. 11520

Filed Nov. 18, 1974, Ser. No. 524,405
Int. Cl.² A01K 29/00
U.S. Cl. 119—29 2 Claims



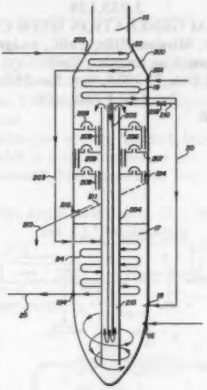
1. A small animal exercise device comprising, in combination, a substantially circular rotatable housing, a plurality of circumferentially disposed spaced ribs carried by said housing, a substantially centrally disposed hub opening provided within said housing, a hub member adapted to fit within said hub opening, said hub member having lateral fastening means thereupon and being provided with a circumferentially disposed cut-out portion thereupon, and an oppositely laterally disposed cap member carried by said hub member.

3,933,127

DESULFURIZATION OF HIGH SULFUR FUELS DURING COMBUSTION

Jan J. Arps, 414 Peony Road, Dallas, Tex. 75215

Filed June 26, 1974, Ser. No. 483,308
Int. Cl.² F22B 1/06; F23G 7/00
U.S. Cl. 122—1 R 45 Claims



1. A method of removing sulfur from a carbonaceous fuel during combustion comprising:
   a. providing a molten bath of a salt;
   b. passing into said bath:
      i. said fuel containing sulfur;
      ii. a collector which will form a compound with said sulfur which is insoluble in said molten salt; and
      iii. oxygen for combustion of said fuel;
   c. allowing said fuel to combust and said compound to form in said molten salt bath; and
   d. removing from said molten salt bath a slurry formed from vaporous products of combustion and said collector, said removing including the steps of applying pressurized air to lift said slurry above said bath, filtering said slurry through an inclined screen positioned above said bath, and removing particles of impurities by the force of gravity.

28. A system for removing sulfur and other impurities from fuel during combustion, which comprises:
   a. a vertical, cylindrical vessel having an enclosed conically-shaped bottom and an open neck;
   b. a molten salt bath filling said bottom;
   c. a plurality of interconnected heat exchange coils situated within said vessel, some of which are positioned near said neck and the remainder of which are embedded in said bath;
   d. a plurality of interconnected pneumatic coils situated within said vessel and positioned near said neck;
   e. a vertical pipe mounted within said vessel extending above and below the surface of said bath;
   f. a vertical tubing mounted within said vertical pipe extending above and below the surface of said bath;
   g. a by-pass valve connected between said plurality of pneumatic coils and said vertical tubing;
   h. two nozzles tangentially disposed in the walls of said vessel below the surface of said bath, one of said two being connected to said plurality of pneumatic coils;
   i. a mixture comprising said fuel and an alkaline-earth metal collector;
   j. a hopper directing said mixture under pressure to a second of said two nozzles;
   k. a plurality of vertically stacked trays positioned above the surface of said bath and connected to the inner walls of said vessel and around the outer circumference of said vertical pipe; and

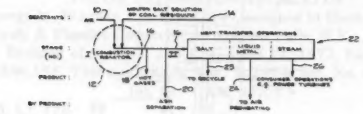
l. an inclined screen positioned below said trays and connected between the inner walls of said vessel and around the outer circumference of said vertical pipe above said bath.

3,933,128

STEAM GENERATION WITH COAL

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Filed Oct. 7, 1974, Ser. No. 512,540
Int. Cl.² F22B 1/06
U.S. Cl. 122—4 R **72 Claims**



1. In the process for the generation and recovery of heat from highly aromatic refractory carbonaceous fuel reactants which include oxidizing the fuel in a molten salt matrix within a reaction zone and recovering heat of combustion from the salt matrix, the steps of mixing the fuel with the molten salt to dissolve the fuel in the salt to form a salt-fuel reactant solution, and thereafter introducing the reactant solution to said reaction zone to effect oxidation of said fuel reactant within the reaction zone.

38. Apparatus for the generation and recovery of heat from highly aromatic refractory carbonaceous fuel reactants said apparatus comprising a reactor, means for mixing said fuel reactant with molten salt to form a salt-fuel reactant solution, means for introducing said solution into said reactor, said reactor defining a through passage for the salt fuel reactant solution, means to pass a free oxygen-containing gas through said reactor differentially to said salt-fuel reactant solution in combustion heat absorbing relation, and means beyond said reactor to transfer said heat from said salt including a high specific heat fluid, and means to recharge said molten salt with fresh fuel reactant following heat transfer and to return said recharged salt to said reactor.

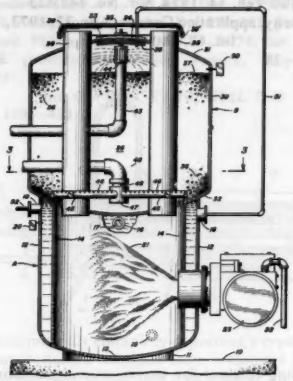
3,933,129

COMBINED LIQUID FILTERING AND HEATING APPARATUS

William A. van den Broek, Doylestown, Pa., assignor to KDI-Sylvan Pools, Inc., Doylestown, Pa.

Filed Mar. 6, 1975, Ser. No. 556,033
Int. Cl.² F22B 7/00, 33/06
U.S. Cl. 122—156 **8 Claims**

1. A combined filtering and heating apparatus comprising heating chamber means, water-jacket means substantially surrounding said heating chamber means, filter means mounted on said heating chamber means, heating means in said heating chamber means for heating water in said filter means and said water-jacket means, supply conduit means for supplying water from a source to said filter means, additional conduit means for supplying water to said water-jacket means



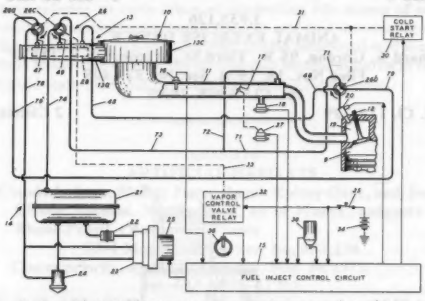
and return conduit means for returning heated water from said filter means and said water-jacket means to said source.

3,933,130

FUEL INJECTION COLD START AND EVAPORATIVE CONTROL SYSTEM USING A BIMODAL ADSORBENT BED

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 295,040, Jan. 1, 1974, Pat. No. 3,838,667. This application Mar. 6, 1974, Ser. No. 448,775
Int. Cl.² F02M 27/02
U.S. Cl. 123—3 **9 Claims**



1. In a high fuel injection system for a spark-ignition combustion engine of the type having a shaft, one or more cylinders each having an injector valve responsive to a control signal for injecting and mixing a predetermined quantity of full-range fuel with air to form a combustible mixture for delivery to such cylinders of said engine, and computing means including synchronizing and condition means for controlling and generating said control signals as a function of one or more engine operating parameters, said synchronizing means being operatively connected to said injection valves for synchronizing operation thereof as a function of predetermined angular position of said shaft by generating a correctly timed start signal for each of said injector valves, said condition means responsive to each of said start signals as well as to signals indicative of other operating parameters, for controlling the duration of energization of said each of said injection valves, the improvement for reducing exhaust pollutants

of said engine by (i) dynamically varying the composition of said full-range fuel during cold starting of said engine (cold start cycle), and alternatively (ii) adsorbing evaporative emissions originating from vapor zones within fuel system at least during an inoperative state of said engine, comprising:

i. cannister means selectively connectable between said injection valves and a reservoir of said full-range fuel including an adsorption bed of adsorbent material,

ii. control means for controlling fluid flow including liquid fuel and vapor emission and flow between said reservoir means, said cannister means and said injection valves as a function of at least one of several engine operating parameters,

iii. said control means including at least first and second precondition means for alternatively (i) initiating, during said cold start cycle, flow of said full-range fuel from said reservoir to said cannister means and hence over said adsorption led so as to elute a cold start fuel effluent composed essentially of low molecular weight liquid constituents, said effluent being passed to said injection valves in sufficient amounts to assure starting of said engine, and (ii) permitting flow of evaporation vapors from said vapor zones of said fuel system to said same adsorption bed for capture thereon during, at least, said inoperative state of said engine.

3,933,131

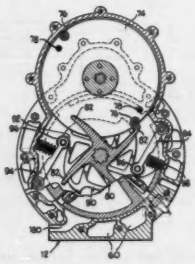
ROTARY ENGINE

Russel I. Smith, 668 Rochdale Circle, Lombard, Ill. 60148

Continuation-in-part of Ser. No. 388,629, Aug. 15, 1973, abandoned. This application July 12, 1974, Ser. No. 488,025

Int. Cl.² F02B *53/00*

U.S. Cl. 123—8.47 **9 Claims**



1. A rotary engine comprising a casing, a rotatable output shaft mounted in said casing, a rotatable rotor shaft mounted in said casing, a pair of concentric rotors comprising an intermittently rotating and constantly rotating rotor in said casing, said intermittently rotating rotor connected to be driven by said rotor shaft, said constantly rotating rotor being drivingly connected to said output shaft and partly defining at least two rotary internal gas expansion chambers, the intermittently rotating rotor being disposed wholly within said constantly rotating rotor and having at least one reaction element thereon disposed within said internal chamber, said rotors both rotating about the axis of said rotor shaft, intermittent drive means connected between said output shaft and said rotor shaft and adapted to intermittently drive said rotor shaft and thereby said intermittently rotating rotor, separate reaction brake means connected to said rotor shaft, said reaction brake means adapted to hold said rotor shaft stationary to provide a reaction for said intermittently rotating rotor whereby when gas expands within said internal chamber said constantly rotating rotor will be driven to drive said output shaft, said brake means comprising cam means formed on said rotor shaft engaged by pivoted followers which permit only one way rotation of said rotor, a driving cam having arms thereon connected to said rotor shaft, a rotary member having a plurality of driving means thereon and driven by said output shaft, said driving means adapted to intermittently engage said driving cam arms to provide for intermittent drive of said rotor shaft, said driving means having two or more roller pairs, which roller pairs successively engage with an arm of the driving cam and thereby move said driving cam to start up slowly and then to stop abruptly as the inner rotor is about to catch up with the outer rotor.

3,933,132

ANOTHER LIQUID-MIXING INJECTION SYSTEM FOR INTERNAL-COMBUSTION ENGINE

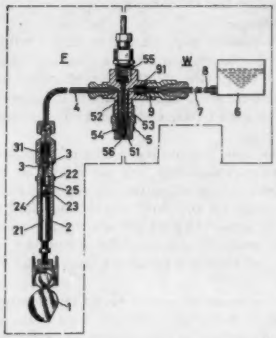
Keiji Kishishita, Yokohama, Japan, assignor to Isuzu Motors Limited, Japan

Continuation-in-part of Ser. No. 441,382, Feb. 11, 1974, abandoned, which is a continuation of Ser. No. 299,617, Oct. 11, 1972, abandoned. This application Dec. 17, 1974, Ser. No. 533,717

Claims priority, application Japan, Oct. 20, 1971, 46-83041

Int. Cl.² F02D *47/00*

U.S. Cl. 123—25 C **5 Claims**

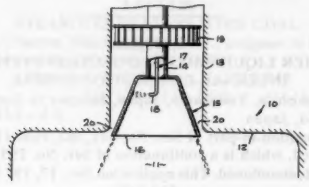


1. In an internal combustion engine provided with a fuel injection system comprising a fuel injection pump arranged to receive a supply of fuel, a delivery valve connected to said fuel injection pump for receiving fuel from said fuel injection pump, a fuel pipe having a first end connected to said delivery valve and a second end, and a fuel injection nozzle connected to the second end of said fuel pipe and arranged to inject fuel into a combustion chamber, and an apparatus for supplying water to said fuel injection nozzle, wherein the improvement comprises that said apparatus for supplying water comprises a water tank, a water pipe interconnecting said water tank and said fuel injection nozzle, and a check valve located in said water pipe, said fuel injection nozzle comprising an orifice through which the fuel is injected into the combustion chamber, said fuel injection nozzle forming a space therein in communication with said orifice so that the fuel flows from the space into said orifice, said fuel injection nozzle forming a fuel passage and a separate water passage with said fuel passage extending between said fuel pipe and said space in said fuel injection nozzle and said water passage extending between said check valve in said water pipe and said space in said fuel injection nozzle, said delivery valve comprises a piston located therein in the path of flow of the fuel from said fuel injection pump to said fuel pipe, said piston being displaceable within said valve from a first position blocking flow therethrough to a second position permitting flow therethrough, said piston having a volume approximately equal to the volume of water to be injected so that as it is displaced from the second position to the first postion a negative pressure is developed in said fuel pipe, said fuel passage and said space and acts in said water passage to open said check valve for admitting an amount of water from said water tank approximately equal to the volume of said piston.

3,933,133
ROTATING CUP FUEL INJECTOR

Jack R. Shekleton, San Diego, Calif., assignor to International Harvester Company, San Diego, Calif.

Filed Nov. 19, 1973, Ser. No. 417,456
Int. Cl.² F02M *61/02*
U.S. Cl. 123—30 C **1 Claim**



1. In a turbine having a combustion chamber, a variable fuel injector comprising:

an annular flange communicating with the combustion chamber;

a frusto-conical cup rotably mounted within said flange whereby the outwardly diverging end of said cup is disposed within the combustion chamber and a throat is formed between said cup and said flange;

means secured to one end of said cup and adapted to rotate said cup;

a hollow tube extending coaxially through said rotating means into said cup, the other end of said tube being disposed intermediate the ends of said cup, whereby fuel is deposited within said cup through said tube;

means for generating a high velocity air stream through the throat and over the outer lip of said cup, said air stream being substantially parallel to the axis of rotation of said cup;

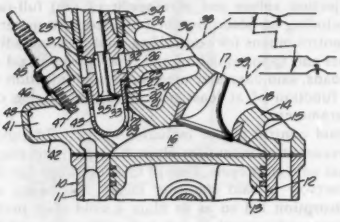
an ignition means mounted within said combustion chamber in substantially normal orientation to the axis of rotation of said cup and in complementary relationship to the lip of said cup, said air generating means and said cup rotating means being operably so that when said cup is first rotated fuel on the inner surface of said cup is caused to leave said cup at a constant spray angle of 180 degrees without significant air blast to allow contact with the ignition means and, after ignition, to provide a high velocity air stream, whereby the fuel and air are intimately mixed and assume a spray angle of less than 180°.

3,933,134
METHOD AND APPARATUS USING PROPORTIONAL RESIDUAL GAS STORAGE TO REDUCE NO_x EMISSIONS FROM INTERNAL COMBUSTION ENGINES

Shizuo Yagi, Asaka, and Kazuo Inoue, Ianashi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,483
Int. Cl.² F02B *19/10*, *19/16*
U.S. Cl. 123—32 SP **19 Claims**

1. In a four-cycle spark-ignition internal combustion reciprocating piston engine having a main combustion chamber with a valved intake passage for a lean mixture, an auxiliary combustion chamber having a valved intake passage for a rich mixture, and a torch nozzle restriction connecting said chambers, the improvement for minimizing NO_x in the engine exhaust gases comprising, in combination: a residual gas chamber having a restricted opening at one end communicating with the auxiliary chamber and having an end wall remote from said opening, a spark plug having electrodes forming a spark gap positioned in said residual gas chamber nearer to the restricted opening than to said end wall, the position of said restricted opening with respect to the auxiliary chamber being such that the suction stroke of the piston serving to draw a rich mixture into and through the auxiliary chamber and through the torch nozzle restriction into the main chamber does not substantially change the contents of the residual gas chamber which comprise residual burned gas from the previous combustion cycle of the engine, the restricted opening

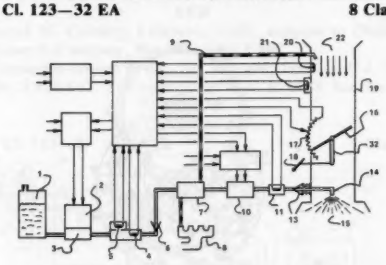


serving to promote mixing of rich mixture and residual gas in said residual gas chamber during the compression stroke of the piston, whereby at the time of ignition, the concentration of residual gas near said end wall of said residual gas chamber is greater than in the region containing said spark gap.

3,933,135
ELECTRONIC CONTROLLED MANIFOLD INJECTION SYSTEM

Jack H. Zillman, 30798 Calle Chueca, San Juan Capistrano, Calif. 92675, and William I. Ballentine, Jr., 103 Paseo Laredo N, Cathedral City, Calif. 92234

Filed May 1, 1974, Ser. No. 465,732
Int. Cl.² F02B *3/00*; F02M *31/00*
U.S. Cl. 123—32 EA **8 Claims**



1. An improved fuel system for an internal combustion engine comprising: a manifold injector for the internal combustion engine; an electric motor-driven fuel pump; combination heating chambers including hot gas and electrical heating means for heating fuel from the fuel pump; a first fuel passage coupling said fuel pump to the combination heating chambers; an electrical temperature control means connected to the electrical heating means for heating the fuel in the combination heating chambers; an injector tube mounted in the manifold injector for receiving the heated fuel from the heating chambers, whereupon its release from the injector tube the fuel is vaporized; a second fuel passage coupling the combination heating chambers to the injector tube; air mass flow electric sensing means mounted in the manifold injector; fuel mass flow electric sensing means mounted in at least one of the fuel passages; electronic circuitry coupled to the electric sensing means and to the electric motor-driven fuel pump and responsive to signals from the electric sensing means to control the speed of the fuel pump and thereby to provide a constant air/fuel ratio through the manifold injector; air throttle means disposed in the manifold injector immediately above the injector tube; a shaft mounted in the manifold injector, said throttle means being connected to said shaft; an accelerator control coupled to the shaft for rotation of said throttle means; a rheostat mechanically coupled to said shaft and electrically connected in circuit with said electronic circuitry for providing means for coupling and controlling electric

power to said electric motor-driven fuel pump; a first electrical Wheatstone type of bridge included in circuit with said electronic circuitry and electrically connected to said air mass flow electric sensing means, said bridge producing signal voltages as a function of air mass flow in the manifold injector; a second electrical Wheatstone type of bridge included in said electronic circuitry and connected to said electric fuel mass flow sensing means, said second bridge producing signal voltages as a function of fuel mass flow; bridge output signal voltage amplifying means included in said electronic circuitry and preset to obtain a constant air/fuel ratio and adjustable for varying the air/fuel ratios; a power switching speed control circuit for the electric motordriven fuel pump, said amplifier means receiving an algebraic sum of the bridge signal voltages from the first and second bridges, and said amplifier means further producing a rising or falling voltage signal to the power switching circuit, said power switching circuit including switching means for conducting electric power from a voltage source to the electric motor-driven fuel pump or to dump electric power from said electric motor to ground, and said power switching circuit including power transmission means to add to electric power conducted through said rheostat to the electric motor-driven fuel pump.

3,933,136

COOLING APPARATUS FOR PASSENGER MOTOR VEHICLE

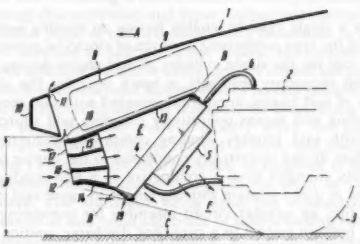
Hermann Burst, Stuttgart, Germany, assignor to Dr. -Ing H.c.F. Porsche Aktiengesellschaft, Germany

Filed Feb. 8, 1974, Ser. No. 440,757

Claims priority, application Germany, Feb. 9, 1973, 2306517

Int. Cl.² F01P *7/00*

U.S. Cl. 123—41.58 **32 Claims**



32. Cooling apparatus for cooling an engine on a motor vehicle comprising:

at least one cooler including means for exchanging heat between cooling air flowing therethrough and an engine cooling medium,

and cooling air guide means for guiding the flow of cooling air to and from said at least one cooler, said guide means including vacuum producing means for producing a cooling air flow inducing vacuum at said cooler in dependence on a driving speed of a vehicle so as to optimize the distribution of cooling air over said cooler,

wherein said vacuum producing means includes means for inducing a vacuum at least at an inlet side of said at least one cooler.

3,933,137

LOAD FOLLOW-UP DEVICE FOR INTERNAL COMBUSTION ENGINE EQUIPPED WITH SUPERCHARGER

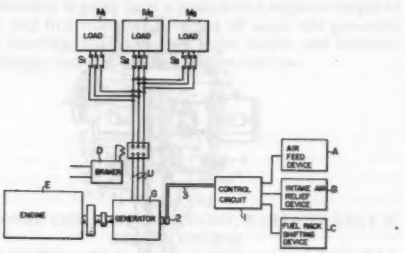
Motohiko Uno, Takatsuki; Shigeaki Noma, Ikeda; Hideo Ujiie, Amagasaki; Kazuo Masui, Nara, and Tadashi Kanesa, Kawanishi, all of Japan, assignors to Yanmar Diesel Engine, Co., Ltd., Osaka, Japan

Filed Mar. 13, 1974, Ser. No. 450,700

Claims priority, application Japan, Jan. 26, 1973, 48-12131[U]; Jan. 26, 1973, 48-12132[U]; Jan. 26, 1973, 48-12133[U]; Feb. 3, 1973, 48-13899

Int. Cl.² F02D *23/00*

U.S. Cl. 123—119 CE **7 Claims**



1. An internal combustion engine having at least one cylinder and equipped with a supercharger for feeding air into the cylinder by way of an intake manifold, a control member for controlling the rate of supply of fuel to the cylinder, and a load follow-up device which comprises:

detector means operatively connected with the engine to sense a sudden application of load to the engine;

air feed means operable to admit air into the engine cylinder directly, without passing through the intake manifold;

intake air relief means operable to vent pressurized air from the intake manifold to atmosphere;

actuating means operable to displace the control member to increase the rate of supply of fuel; and

control circuit means connected to th detector means to respond substantially instantly to a sensed sudden application of load by operating the air feed means, the intake air relief means and the actuating means to admit air into the cylinder directly, vent pressurized air from the intake manifold, and increase the rate of supply of fuel thereby to follow-up faithfully the application of the additional load and prevent reduction in engine speed.

3,933,138

SPARK DISTRIBUTOR

Jean Henri Stellwagen, Paris, France, assignor to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal, Issy-les-Moulineaux, France

Filed Dec. 20, 1973, Ser. No. 426,898

Claims priority, application France, Dec. 27, 1972, 72.46487

Int. Cl.² F02P *1/00*

U.S. Cl. 123—146.5 R **17 Claims**

1. Method for obtaining optimum static adjustment in the spark point of a variable magnetic flux spark distributor for an internal combustion engine and the like, which distributor is comprised of:

a. a housing **1**;

b. a spark shaft **2** inside said housing **1**;

c. a gear **18** on and driven by said shaft **2** and rotatably movable with respect to said shaft **2**; under the effect of

d. at least one advancing wheel device element **9** displaced in said distributor housing **1**; all in relationship with

e. a magnetic flux captor element **33** which channels magnetic flux towards said shaft **2**;

f. said captor element **33** being in connected correspon-

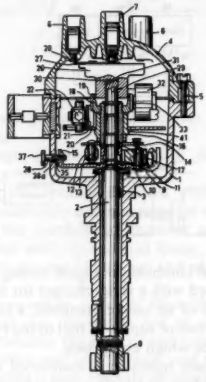
dence with the nucleus center of an induction coil **32**; all wherein there is

g. a slot **35** in the wall of said housing **1** generally disposed within the zone of said advancing wheel element **9**, and also disposed so as to be substantially perpendicular to the axle of said shaft **2**; wherein

h. said advancing wheel element **9** has an orifice **36** in the area located opposite said slot **35**;

which method comprises:

A. Providing for association with said advancing wheel element **9** a bar-like setting device **38** of sufficient length to extend from the orifice of said wheel element **9** through said slot **35** without said housing **1**, said setting device **38** having a frangible head portion **37**



and an intermediate fragile and breakable sector **38***a* disposed inwardly from its head **37**;

B. Passing said setting device **38** through said slot **35** in the housing **1** to engage it in said orifice **36** with said fragile and breakable sector **38***a* disposed within said housing **1**; while

C. Simultaneously holding from without said housing **1** the extending head extremity **37** of said bar-like setting device **38**;

D. Positioning in an optimum co-relative spacing relationship said gear **18** and said captor element **33**; upon which

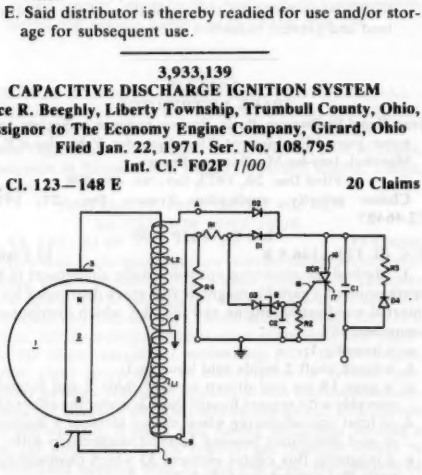
E. Said distributor is thereby readied for use and/or storage for subsequent use.

3,933,139

CAPACITIVE DISCHARGE IGNITION SYSTEM

Bruce R. Beeghly, Liberty Township, Trumbull County, Ohio, assignor to The Economy Engine Company, Girard, Ohio

Filed Jan. 22, 1971, Ser. No. 108,795
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 E **20 Claims**



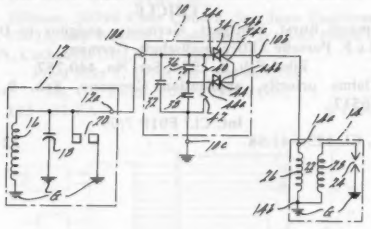
1. An ignition system for an internal combustion engine comprising an alternating current generator synchronized with the engine, said alternating current generator having two windings, said two windings being of unequal turns and of opposite polarity, at least one high tension ignition coil having a primary and secondary winding, at least one first circuit for creating and releasing a capacitive discharge through the primary winding, and at least one second circuit including at least one spark plug in series with the secondary winding, said capacitive discharge circuit comprising a storage capacitor, a thyristor having two main terminals and at least one trigger terminal, said main terminals in series with said capacitor and primary winding, a rectifying circuit connected to the alternating current generator and to the storage capacitor for charging the capacitor with a direct current, a voltage sensitive trigger circuit connected to the high turns winding of said generator and to the trigger terminal of the thyristor whereby when the voltage in the trigger circuit reaches a given threshold voltage, the thyristor is triggered discharging the capacitor through the primary winding of the coil.

3,933,140

CAPACITIVE DISCHARGE IGNITION ADAPTER

George E. Gynn, Fort Wayne, Ind., assignor to Syncro Corporation, Oxford, Mich.

Filed July 25, 1973, Ser. No. 382,475
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 CC **37 Claims**



1. For a single cylinder engine having an existing ignition system of the type comprising a source of electrical power, an ignition coil for the single cylinder of said engine having primary and secondary windings, a spark plug for the single cylinder of said engine operatively coupled with said secondary winding and means operatively coupling said source of power with said primary winding comprising a controlled conduction device operatively connected to the engine to be alternately changed from a conductive to a non-conductive condition in timed relation with the engine to cause said spark plug to fire, an adapter circuit assembly for converting the existing ignition system to a capacitor discharge ignition system and interconnectable between said controlled conduction device and said primary winding, said adapter circuit assembly comprising:

a capacitor means;

input circuit means for operatively coupling said capacitor means with said controlled conduction device and said source of power such that said capacitor means is charged from said source of power when the conduction of said controlled conduction device is changed; and

output circuit means including a triac having blocking and conducting states and comprising a trigger terminal via which said element is switched from the blocking state to the conducting state, and including a diac operatively coupling said capacitor means with said trigger terminal, said triac operatively coupling said capacitor means with said primary winding, said diac being responsive to the magnitude of charge voltage across said capacitor means as said capacitor means charges subsequent to the change of conduction of said first controlled conduction device for switching said triac from its blocking state to its conducting state after said magnitude of charge voltage has attained a predetermined level to discharge said capacitor

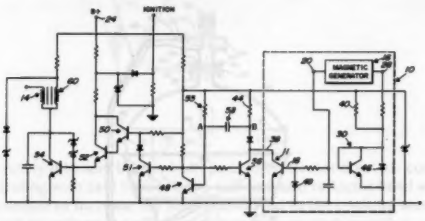
means into said primary winding and thereby cause the spark plug to fire.

3,933,141

ZERO CROSSING CIRCUIT FOR ELECTRONIC IGNITION SYSTEM

Philip D. Gunderson, Arlington Heights, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 7, 1974, Ser. No. 449,185
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **4 Claims**



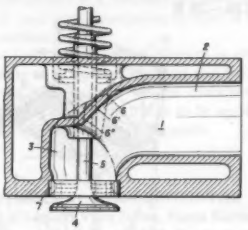
1. An electronic ignition system comprising an ignition coil for providing a high voltage output, ignition circuit means connected to said coil, and ignition timing generator means having first and second output terminals and operable to provide an output voltage varying in amplitude from some positive to some negative voltage, said generator means being connected at the output terminals thereof to said ignition circuit means for initiation of the operation thereof, said ignition circuit means including temperature compensation means for detecting the zero crossing point of said generator means and including a first transistor having predetermined operating characteristics and input, output and common electrodes, the input of said transistor being connected to the first output terminal of said generator means, the common electrode of said first transistor being directly connected to a fixed reference potential, and biasing means having predetermined values connected to said first transistor for establishing therein a first predetermined current density when the generator output at the first terminal thereof is zero, and cooperating with the first transistor characteristic to establish at that current density the switching voltage at the input of said first transistor, said transistor being rendered conductive upon application at said input electrode of said switching voltage by said generator means to produce an output between said output and common electrodes of said first transistor for operating said ignition circuit means, said biasing means including a second transistor having operating characteristics similar to that of said first transistor and having input, output and common electrodes, said input and output electrodes being coupled together causing said transistor to operate effectively as a diode and being coupled to the second output terminal of said generator means, the common electrode of said second transistor being connected to the reference potential, said biasing means biasing said second transistor into conduction to establish therein a second predetermined current density substantially equal to the first predetermined current density when the generator output at the first terminal thereof is zero in order to maintain the second output terminal of said generator means at a voltage level substantially the same as the switching voltage established at the input of said first transistor and to maintain said first transistor in a partial state of conduction when the output voltage of said generator means at the first terminal thereof is zero, the switching voltage at the input of said first transistor changing with temperature or supply voltage variations and the voltage level at the second output terminal of said generator means being maintained in accordance therewith, said switching voltage of said first transistor substantially corresponding to the zero crossing point at the first output terminal of said generator means when said generator is going from a negative to a positive output to ensure said first transistor is turned on upon said generator means reaching its zero crossing point despite said temperature changes and said supply voltage variations, said second transistor having a lower dynamic impedance than a conventional diode to maintain a low impedance at the input of said first transistor and further comprising said biasing means having predetermined values establishing the switching voltage at a level substantially corresponding to the zero crossing point at the first output terminal of said generator means when said generator is going from a positive to a negative output to ensure said first transistor is turned off upon said generator means reaching its zero crossing point despite said temperature changes and said supply voltage variations.

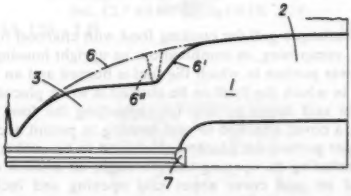
3,933,142

INTERNAL COMBUSTION ENGINE, PARTICULARLY A DIESEL ENGINE

Hans List; Rainer Cichocki; Karl Kirchweger, and Friedrich Steinwandter, All of Graz, Austria, assignors to Hans List, Graz, Austria

Filed June 5, 1974, Ser. No. 476,515
Claims priority, application Austria, June 8, 1973, 5115/73
Int. Cl.² F01L *3/00*
U.S. Cl. 123—188 M **3 Claims**





1. An internal combustion eninge, in particular a Diesel engine, comprising at least one inlet valve for each cylinder, arranged in eccentric relation to the cylinder axis, an inlet duct connected to said inlet valve and comprising a delivery portion and an adjoining spiral-shaped duct portion, said inlet valve having a valve stem extending through the spiral-shaped duct portion, said inlet duct having a reduction of the cross-sectional area formed by a portion of an upper duct wall comprising a stepped portion or rib protruding into the inlet duct at the point of transition from the delivery portion to the spiralshaped duct portion and extending in transverse relation to the direction of the delivery portion.

3,933,143

COMBUSTION CHAMBER PROTECTION MEANS

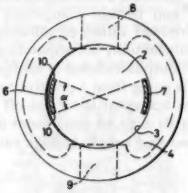
Rudolf Gürtler, Endersbach, Germany, assignor to Mahle GmbH, Stuttgart, Germany

Filed May 28, 1974, Ser. No. 473,685

Claims priority, application Germany, May 30, 1973, 2327551

Int. Cl.² F02F 3/28

U.S. Cl. 123—193 P 8 Claims



1. In a combustion engine of which the pistons are provided with a combustion chamber, the provision of means for protecting the edge of the mouth of the opening of the combustion chamber from the formation of cracks, said protecting means being arranged in the two peripheral zones of said edge adjacent the supporting sides of the piston and extending over an angle of not more than 90° over the central point of each supporting side.

3,933,144

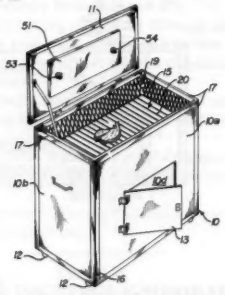
BARBECUE GRILL CONSTRUCTION

Clyde Bandy, 7138 Conley, Houston, Tex. 77021

Filed July 13, 1973, Ser. No. 379,112

Int. Cl.² A47J 37/07; F24B 3/00

U.S. Cl. 126—25 R 1 Claim



1. A barbeque grill for cooking food with charcoal fuel, or the like, comprising, in combination: an upright housing having a lower portion in which the fuel is burned and an upper portion in which the food to be cooked is to be placed; grill means in said upper portion for supporting the food to be cooked; a cover attached to said housing to permit access to said upper portion for placement of food to be cooked, said cover including an opening therethrough; air control means disposed on said cover about said opening and including means for adjusting the quantity of air flow through said opening for controlling the flow of smoke from said housing, said air control means including a louvered member mounted over said opening on the outside of said cover, and a plate mounted over said opening on the inside of said cover, and means for so mounting said plate while permitting movement of said plate to and from said opening, said means including resilient means for biasing said plate away from said opening; rack means in said lower portion for supporting said fuel for burning; and a wick type fuel igniter located in said lower portion and disposed to rotate from a first position for lighting said fuel, to a second position wherein the wick is protected from drippings from the food being cooked, said igniter including an elongated trough for accumulation of a liquid fuel, an elongated wick extending from said trough and a shield member extending from the side walls of said trough and extending over said trough to shield said wick when in second position, and further including mounting means for mounting said igniter on and beneath said rack for movement between said first and second position, and a door in said housing for permitting access to said lower portion thereof.

3,933,145

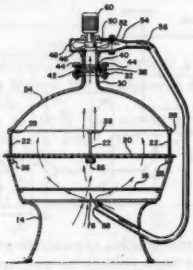
RECIRCULATING BARBEQUE DEVICE

Harry Reich, 2931 Fillmore, San Francisco, Calif. 94123

Filed Aug. 5, 1974, Ser. No. 494,846

Int. Cl.² A47J 37/07; F24B 3/00

U.S. Cl. 126—25 R 4 Claims



1. A cooking device for use with a charcoal-type open receptacle having a charcoal burning area comprising: a hood having means for supporting said hood over the open receptacle; a flue connected to said hood with an opening for collecting smoke and gases from combustion of charcoals in said receptacle; filter means connected to said flue for filtering particulate matter from the smoke and gases of combustion, said filter means including fan means for conveying smoke and gases through the filter means; a conduit having a first end and a second end, said conduit having further first means for connecting the first end of the conduit to the filter means, and second means for directing the second end of said conduit at the charcoal burning area of said receptacle; and, an air admission vent in said receptacle proximate to said charcoal burning area, wherein said second end of said conduit is directed at said air admission vent from outside said receptacle, the end of said conduit being proximately arranged with said air admission vent and adapted to aspirate air into said vent by action of said smoke and gases conveyed into said receptacle from said conduit.

3,933,146

PORTABLE SINGLE BURNER CAMPSTOVE

Thomas C. Hastings, Willowdale, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.

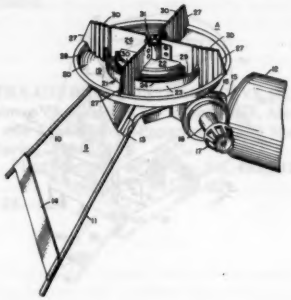
Filed Mar. 12, 1975, Ser. No. 557,761

Int. Cl.² F24C 5/20

U.S. Cl. 126—38 8 Claims

1. In a portable single burner campstove, the combination providing increased wind resistance and high efficiency, comprising: a cooking unit assembly including a reflector bowl providing an upwardly extending outer wall portion, a burner within said reflector bowl, and grate means for supporting a cooking utensil over said burner, a burner bowl having an outer upwardly extending wall intermediately located between said burner and said reflector bowl wall portion, said burner providing a tubular side wall in opposed relation to said burner bowl wall and having a multiplicity of flame ports distributed therearound and arranged to direct flame jets outwardly toward said burner bowl wall for impingement thereon, said grate means including at least three vertically oriented strips

of sheet metal extending outwardly from the central portion of said assembly over said burner, burner bowl, and reflector bowl, the upper edges of said strips providing support for a cooking utensil, said strips having portions extending downwardly into said burner bowl and said reflector bowl for cooperating with said burner bowl wall and said reflector bowl wall portion to increase the heat transferred to the cooking utensil and to reduce the effect of crosswinds on such transfer.

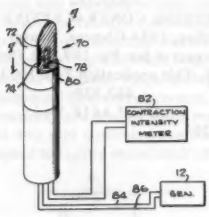


3,933,147

APPARATUS AND METHOD FOR TREATING DISORDERS IN THE REGION OF THE PUBOCOCCYGEOUS MUSCLE

Wilbur E. Du Vall, 22710 Pennsylvania Ave., Torrance, Calif. 90501, and Roger J. Foster, 26614 Menominee Place, Palos Verdes, Calif. 90274

Filed Apr. 2, 1970, Ser. No. 25,022
Int. Cl.² A61B *5/10*; A61N *1/32*
U.S. Cl. 128—2 S **1 Claim**



1. Apparatus for treating a muscle in the pelvic region comprising:

a probe of a width on the order of an inch to permit insertion into the adult human vagina, said probe having spaced electrode means thereon for applying currents to the body and strain gauge means for sensing the intensity of muscle contractions that tend to compress the electrodes;

a generator coupled to said electrode means, said generator constructed to generate trains of pulses at a repetition rate within the range of 100 per second to 400 per second; and

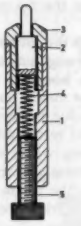
meter means coupled to said strain gauge means for providing an indication of the level of intensity of muscle contractions.

3,933,148

DEVICE FOR DETERMINING SKIN SENSITIVITY

Eugen Wyler, Kusnacht, and Wladimir Tur, Mutschellen, both of Switzerland, assignors to Lovida AG, Oberwil near Zug, Switzerland

Filed Apr. 12, 1974, Ser. No. 460,462
Claims priority, application Switzerland, Apr. 16, 1973, 5483/73
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 R **6 Claims**



1. A device for determining the degree of skin sensitivity due to the persistence of a scratch trace on the skin surface produced by said device, comprising:

a housing having a base surface;

at least one pressure element having one end extending into said housing and having a rounded trace producing surface on the other end thereof, said trace producing surface protruding from said housing at said base surface;

compressible means within said housing in engagement with said pressure element, having a predetermined spring force, for compressing said at least one pressure element against the skin surface at a constant pressure of 250–500 gm/mm² when said trace producing surface is depressed to said base surface,

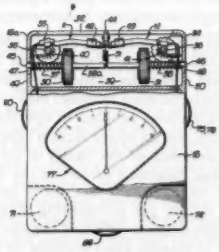
whereby said at least one pressure element is depressable into said housing at a constant pressure and therefore the pressure on the skin surface will be constant, thereby allowing a plurality of scratch traces to be applied to the skin surface at the same surface pressure.

3,933,149

ANISOTHERMAL DIFFERENTIATOR

Edmond A. Salera, 714 Surf View Drive, Santa Barbara, Calif. 93109, and Edmond E. Salera, 1522 Centinela Ave., Los Angeles, Calif. 90025

Filed Apr. 18, 1974, Ser. No. 461,854
Int. Cl.² A61B *5/00*; G01K *7/24*
U.S. Cl. 128—2 H **17 Claims**



1. In local body heat sensing instrumentation, the combination comprising

a. first and second probes each including a tip having a frontwardly exposed surface shaped for application in heat transfer proximity with a patient's body, the tip

consisting of material characterized as electrically insulative and heat conductive,

b. first and second electrically energizable means carried by the respective probes to detect heat transfer between said surface and the source via said material, said frontwardly exposed surface of each tip being generally convex,

c. each probe including an openly hollow and forwardly elongated support, said tip confined at the forward end of said support, said tip having a rearward surface facing and exposed to the hollow interior of the support, the outer extent of the tip connected to the support, each said means embedded in the tip material between said front and rear surfaces,

d. a carrier from which the probes extend in active positions to locate the tips for engaging a human patient's body, the carrier including a housing, there being rotary means including worm gear means on the carrier and supporting the probes for rotation between extended positions outside the housing and retracted positions inside the housing, there also being worm means on the carrier and meshing with the worm gear means, and manually operable means to rotate the worm means, and

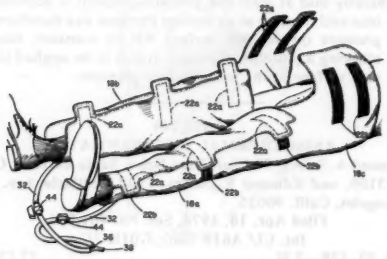
e. recording means electrically connected with said electrically energizable means.

3,933,150

MEDICAL PNEUMATIC TROUSER FOR EMERGENCY AUTOTRANSFUSION

Burton H. Kaplan, Fort Leavenworth, Kans.; Forrest R. Poole, and John E. Flagg, both of Worcester, Mass., assignors to David Clark Company Incorporated, Worcester, Mass.

Filed Feb. 8, 1974, Ser. No. 440,644
Int. Cl.² A61H *1/00*
U.S. Cl. 128—24 R **5 Claims**



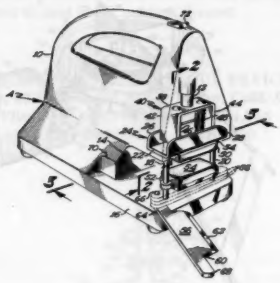
1. Apparatus for transferring pooled venous blood in the lower extremities and abdominal area of a victim suffering from shock, said apparatus comprising: a doublewalled panel of flexible material forming chamber means, said panel having a pair of lower sections adapted to operatively surround the legs of the victim and an upper section adapted to operatively surround the abdomen of the victim in the region below the victim's rib cage; fastening means on the exterior surface of said panel for retaining said sections in their operative positions on the victim; gas pressurizing means adapted to be placed in communication with said chamber means for inflating said panel to thereby exert pressure on the legs and abdomen of the victim in order to decrease the volume of venous blood pooled therein and thus increase venous return to the victim's heart; and normally closed valve means communicating with said chamber means and being operative to open in response to the attainment of a selected level of gas pressure in said chamber means to bleed gas from said chamber means.

3,933,151

DEVICE FOR MASSAGING A FINGER

Joe Huie, 122 E. 5th St., Duluth, Minn. 55805

Filed Dec. 12, 1974, Ser. No. 532,020
Int. Cl.² A61H *7/00*
U.S. Cl. 128—52 **2 Claims**



1. A device for massaging a finger comprising:

a. a main support,

b. an operable reciprocating member mounted on said main support,

c. an upper resilient pad,

d. means mounting said upper pad on said main support for reciprocal movement by said reciprocating member,

e. means normally urging said upper pad against reciprocation,

f. a lower resilient pad carried by said main support,

g. means mounting said lower resilient pad on said support in alignment with said upper pad on which a finger is supported for intermittent contact with said upper pad in its reciprocating action,

h. means for adjustably positioning said lower pad relative to said upper pad, said adjustable means including:

i. at least one plate and

j. means for removably positioning said plate between said lower pad and said main support.

3,933,152

INTRAUTERINE CONTRACEPTIVE DEVICE

Thomas S. Moulding, 1954 Glencoe, Denver, Colo. 80220

Continuation-in-part of Ser. No. 189,212, Oct. 14, 1971, Pat. No. 3,802,425. This application Feb. 19, 1974, Ser. No. 443,338
Int. Cl.² A61F *5/46*
U.S. Cl. 128—129 **12 Claims**

1. An intrauterine contraceptive device made of biomedical material and which conforms to the size and shape of the uterus after insertion therein, said device comprising:

an inflatable member having a first inlet insertable into a uterus in a collapsed position and movable into an expanded position within the uterus upon introduction of a fluid into said member through said first inlet; and

tubular means connected to and extending around the periphery of said inflatable member and having a second

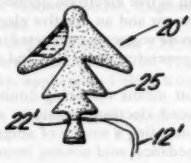
inlet for receiving a self-hardening liquid plastic so that after said device is positioned in the uterus and said inflatable member is expanded to position said tubular means against the uterine walls, the liquid plastic which has been introduced into said tubular means through said second inlet in said tubular means will hold said tubular means in position against the uterine walls after which said member is deflated.

3,933,153

INTRA-UTERINE CONTRACEPTIVE DEVICE

Laszlo Kalman Csatary, 1913 Windsor Road, Alexandria, Va. 22307, and Frank Istvan Pongracz, 10833 Margate Road, Silver Spring, Md. 20901

Filed Mar. 18, 1974, Ser. No. 451,742
Int. Cl.² A61F 5/46
U.S. Cl. 128—129 **4 Claims**



1. An intra-uterine contraceptive device comprising a hollow body made from a biologically inert resilient material, said body including a plurality of adjacent free and hollow arm means adapted to expand when said contraceptive device is inflated by means of a fluid within the uterus, said arm means having free end portions rounded-off for coming into direct contact with the inner walls of the uterus when in the extended position preventing the expelling of the contraceptive device through the cervix due to expelling forces exerted thereon by the uterus, wherein said plurality of arm means extend from said body in a christmas-tree-like fashion laterally and retrogressively when said contraceptive device is inflated, said adjacent arm means leaving sufficient space when extended with the adjacent arm means for allowing the unimpeded passage of the menstrual flow therebetween, said body including a portion containing self-sealing valve means for the injection of said fluid into said contraceptive body and said valve means being adapted to tightly reseal itself after the injection.

3,933,154

IMMOBILIZER DEVICE

Edwin M. Cabansag, 3937 Johnson St., Western Springs, Ill. 60558

Filed Jan. 15, 1974, Ser. No. 433,452
Int. Cl.² A61F 5/37
U.S. Cl. 128—134 **22 Claims**

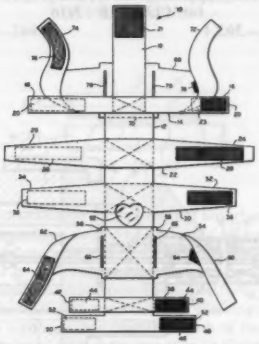
1. An immobilizer for use in X-ray or surgical procedures on a patient comprising:

a completely flexible radiotransparent member including flexible restraining means,

said flexible member having a front surface adapted to extend longitudinally adjacent the posterior of said patient and a posterior surface;

said restraining means adapted to extend around portions of said patient and secure said patient to said flexible member and against movement; and

a rigid radiotransparent backing member removably attached to one of said surfaces of said flexible radiotransparent member to alternatively provide a rigid support for said member when desired.

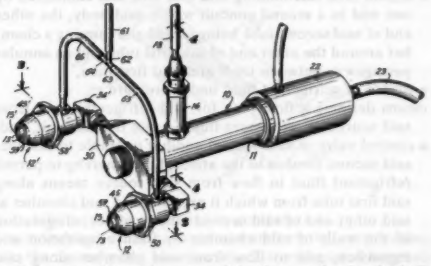


3,933,155

PRESSURE INJECTOR APPARATUS HAVING IMPROVED TRIGGER MECHANISM

Charles Johnston, Roanoke, Va., assignor to Mizzy Inc., Clifton Forge, Va.

Filed Jan. 23, 1975, Ser. No. 543,438
Int. Cl.² A61M 5/30
U.S. Cl. 128—173 H **7 Claims**

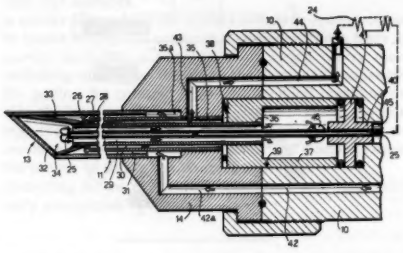


1. In a transdermal pressure injection mechanism including a body portion having a liquid reservoir, and discharge means for expelling predetermined dosages of liquid under high pressure from said reservoir to a discharge conduit, a self-triggering nozzle assembly fixed to an end of said body portion, said assembly comprising a collar member having an internal bore terminating in an outwardly facing mouth portion, a discharge nozzle mounted in said bore in spaced relation to said collar and extending substantially parallel thereto, said nozzle including a face portion projecting through said mouth portion, said nozzle including an orifice extending through said face portion and connected to said discharge conduit, said nozzle and collar defining therebetween a chamber opening outwardly through said mouth, trigger conduit means for introducing air under pressure into said chamber, and sensor means operatively connected to said trigger conduit means for energizing said discharge means to expel a dosage of liquid through said orifice responsive to a pressure variation of a predetermined magnitude sensed in said conduit means as a result of substantially sealing said mouth portion of said chamber by positioning of said mouth against an injection site.

3,933,156
COOLING APPARATUS PARTICULARLY FOR MEDICAL-SURGICAL USE

Giovanni Riggi, Via Giacosa 2 bis, Turin, Italy

Filed Jan. 8, 1975, Ser. No. 539,564
Claims priority, application Italy, Jan. 15, 1974, 67108/74
Int. Cl.² A61B 17/36
U.S. Cl. 128—303.1 3 Claims



1. In a refrigerating apparatus suitable for medical use, of the type comprising:

a body,

a tubular probe projecting from said body, said probe comprising,

a first tube formed as a capillary tube, and connected by one end to a first conduit within said body,

a second tube surrounding said first tube and connected by one end to a second conduit within said body, the other end of said second tube being closed and forming a chamber around the other end of said first tube and an annular passageway between itself and said first tube,

a source of refrigerant fluid under pressure,

means defining a flow path for said refrigerant fluid from said source of refrigerant fluid to said first conduit, and

a control valve in said second conduit operable to connect said second conduit to the atmosphere whereby to permit refrigerant fluid to flow from said source means along said first tube from which it expands into said chamber at said other end of said second tube to effect refrigeration of the walls of said chamber by flash evaporation and expansion, and to flow from said chamber along said annular passageway through said control valve to the atmosphere,

the improvement wherein,

said second tube is surrounded by a third tube which is coaxial therewith and spaced therefrom to define a second annular passageway between said second and third tubes,

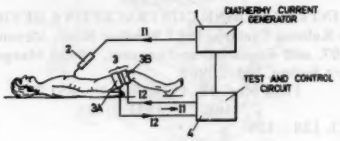
said third tube is surrounded by a fourth tube which is coaxial therewith and spaced therefrom to define a third annular passageway, said second and third annular passageways communicating with one another but not with said expansion chamber at said other end of said probe and said second and third tubes being of such a length that they surround all but a part of said expansion chamber, which is left exposed, and

means interconnecting said second and third annular passageways in series in the flow path of said refrigerant between said source and said first tube whereby said refrigerant acts as a thermal insulation for said first and second tubes which are in thermal contact with said expansion chamber.

3,933,157
TEST AND CONTROL DEVICE FOR ELECTROSURGICAL APPARATUS

Per Henrik Bjurwill, Bromma, and Nils Bertil Jacobson, Solna, both of Sweden, assignors to Aktiebolaget Stille-Werner, Sweden

Filed Oct. 23, 1973, Ser. No. 408,535
Int. Cl.² A61B 17/36; A61N 3/00
U.S. Cl. 128—303.14 5 Claims



1. A test and control device for an electrosurgical diathermy current circuit of the type having a high-frequency diathermy current generator, an active electrode connected to the diathermy current generator and an inactive electrode comprising two spaced electrode segments connected in parallel to the diathermy current generator, said test and control device comprising:

a. a sensing circuit means for being connected in series through the spaced electrode segments as bridged by a patient's body including a source of alternating test current and an impedance, said sensing means comprising;

1. a free-running multivibrator having two operating states, and

2. a relay having a coil connected to and controlled by said multivibrator and a two-position switch arranged to disconnect the spaced electrode segments from the diathermy current circuit in one position;

b. means for automatically and repetitively sensing the resulting voltage drop across the electrode segments;

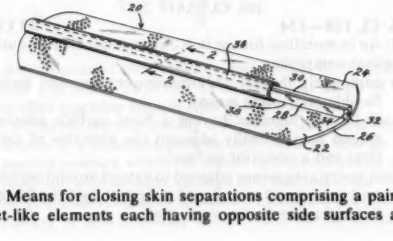
c. means connected to said sensing means and adapted to be connected to the diathermy current circuit and responsive to such voltage drop for inhibiting the passage of diathermy current whenever said voltage drop exceeds a predetermined maximum, or is less than a predetermined minimum said inhibiting means adapted to be connected to said electrode segments through the second position of the two-position switch; and

d. circuit means controlled by said inhibiting means for applying said alternating test current to said multivibrator to hold it in that state by which said relay coil is deenergized.

3,933,158
SKIN CLOSURE MEANS

Charles B. Haverstock, 44 Frederick Lane, Glendale, Mo. 63122

Filed Feb. 15, 1974, Ser. No. 442,784
Int. Cl.² A61B 17/08
U.S. Cl. 128—335 20 Claims



1. Means for closing skin separations comprising a pair of sheet-like elements each having opposite side surfaces and

adjacent side edges, an adhesive substance applied to corresponding side surfaces of each of said elements for attaching the elements to the skin adjacent to a skin separation with the side edges of said elements extending respectively along and closely adjacent to opposite sides of the skin separation, cooperating means on each of said sheet-like elements extending along the respective side edges thereof on the opposite sides thereof from the adhesive substance, the cooperating means and the adjacent sheet side edges on said elements being movable into abutment to close the skin separation, and elongated channel shaped means having continuous opposed edges extending substantially continuously the full length of the cooperating means cooperatively removably engaged with said cooperating means on said elements to hold said cooperating means together in abutment, said channel shaped means applying substantially uniform pressure to hold the elements together along the length of the engagement between the channel shaped means and the cooperating abuting means on the adjacent sheets.

3,933,159

MANUFACTURE OF MOUTHPIECE CIGARETTES

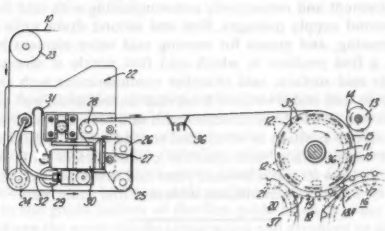
Desmond Walter Molins, London, England, assignor to Molins Limited, England

Continuation-in-part of Ser. No. 222,568, Feb. 1, 1972, abandoned. This application Mar. 26, 1974, Ser. No. 454,953

Claims priority, application United Kingdom, Feb. 9, 1971, 4284/71

Int. Cl.² A24C *5/48, 5/58*

U.S. Cl. 131—94 **5 Claims**



1. Apparatus for making mouthpiece cigarettes by uniting a length of mouthpiece material to each cigarette in abutting relationship thereto by means of an encircling uniting band, comprising a rotatable drum, means to apply molten hot melt adhesive to a continuous web of uniting band material, means to deliver the web onto the drum at a temperature slightly below the melting point of the adhesive and at a speed less than the peripheral speed of the drum, severing means to sequentially cut off the successive foremost ends of the web on the drum to form a succession of uniting bands spaced apart by a gap, heating means to apply sufficient heat to the drum to re-activate the adhesive on the uniting bands, a rolling member having a concave part-cylindrical surface spaced from the drum to define a rolling passage therebetween, and conveyor means to directly deliver cigarette assemblages each with an aligned and abutted mouthpiece portion to said passage in timed relationship with the leading end of a re-activated uniting band so that said re-activated band is rolled in said passage around the preceding assemblage, the temperature of the rolling member being low enough to cool the adhesive to cause it to set.

3,933,160

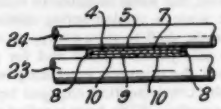
TOBACCO-SMOKE FILTERS

Guy V. A. Gerardy, Waterloo, Belgium, assignor to British-American Tobacco Company Limited, London, England

Filed Aug. 22, 1973, Ser. No. 390,504

Claims priority, application Belgium, Sept. 1, 1972, 12161

Int. Cl. A24c *5/50*

U.S. Cl. 131—264 **3 Claims**

1. A tobacco-smoke filter composed of absorbent paper and a filtering composition comprising a tow of material, selected from the group consisting of fibres and filaments, associated with the paper in superimposed layers, wherein the absorbent paper and filtering composition are in the form of strips extending longitudinally of the filter, the filtering-composition strip having a width greater than the width of the paper strip and being associated with the paper strip to cover one face of the latter and having folds along the two longitudinal edges of the paper strip to form marginal portions covering at least part of the other face thereof.

3,933,161

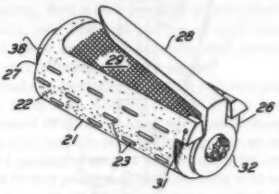
HAIR CURLER AFFIXABLE WITH ONE HAND

Donna F. Strickman, and Melvyn B. Strickman, both of Academy St., Shiloh, N.J. 08353

Filed Apr. 28, 1975, Ser. No. 572,284

Int. Cl.² A45D *2/00*

U.S. Cl. 132—40 **3 Claims**



1. A hair curler comprising in combination:

a cylindrical drum having a circumferential outer surface, the drum having an axis and a first end spaced longitudinally from a second end,

the drum provided with a jaw arranged longitudinally therealong and moveable between a first jaw orientation wherein it is urged to engage the outer surface of the drum and a second jaw orientation wherein it is spaced from the drum,

a crank connected fixedly to the jaw and connected hingedly to the drum at said first end, a crank spring connected between the drum and the crank to urge the jaw normally into said first jaw orientation,

the crank moveable manually from said first jaw orientation to said second jaw orientation overcoming the crank spring,

the first end of the drum provided with a bearing organized along the axis and adapted to receive a shaft journaled axially therein,

a shaft biasing spring connected between the bearing and the shaft normally to urge the shaft toward the second end of the drum,

the shaft provided at the second end of the drum with a clutch which is rotatable only in a positive sense of rota-

tion about said axis and not rotatable in a negative sense of rotation thereabout,

the second end of the drum provided with a clutch seat projecting into the drum to engage the clutch,

a detent penetrating the drum via the second end thereof and along the axis, the detent connected to the clutch, the detent moveable manually to a first detent position overcoming the detent biasing spring to disengage the clutch,

the detent having a knob connected thereto and outward of the second end, the knob turnable to rotate the shaft in said positive sense, a torsion spring connected between the drum and the shaft to store energy on said rotating of the shaft in said positive sense and for giving up said energy to turn the drum on unwinding in said negative sense whereby a hair section engaged between the jaw and the outer surface of the drum is rolled onto the drum.

3,933,162

COIN FEEDING DEVICES

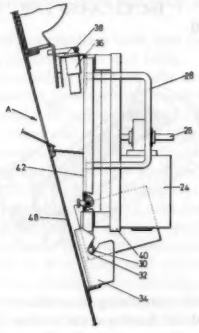
Colin Howard Stanwell Smith, Cambridge, England, assignor to Automatic Revenue Controls (Europa) Ltd., Watford, England

Continuation-in-part of Ser. No. 467,875, May 8, 1974, abandoned. This application Sept. 3, 1974, Ser. No. 502,525

Claims priority, application France, May 16, 1974, 74.17128; United Kingdom, May 17, 1973, 23663/73

Int. Cl.² G07D *3/00*

U.S. Cl. 133—1 R **25 Claims**



1. Apparatus for feeding coins in a coin operated device, comprising

a rotatable disc,

entry guide means arranged to guide a coin onto the surface of the disc,

means mounting the disc for rotation about an axis which is tilted from the horizontal;

a motor drivingly connected to the disc;

at least one pair of coin-engaging pins projecting outwardly from the surface of the disc, the two pins of each pair being spaced apart radially on the disc a distance slightly less than the diameter of the smallest coin to be handled,

an exit chute for the coin,

whereby when a plurality of coins are fed into the guide means, each coin in turn is engaged by a set of pins and carried to the exit.

3,933,163

SPRAY ETCHING APPARATUS

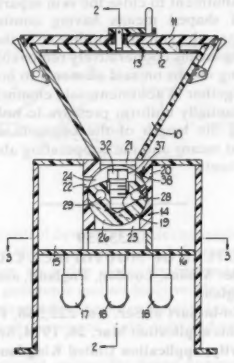
Maurice Parramore, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 4, 1975, Ser. No. 547,006

Claims priority, application United Kingdom, Mar. 14, 1974, 11418/74

Int. Cl.² B08B *3/02*

U.S. Cl. 134—96 **6 Claims**



1. A spray etching apparatus comprising a chamber having a surface to which workpieces to be etched may be secured, a valve element movable within a housing and including first and second supply passages for an etchant and a rinsing fluid respectively, first and second spray nozzles mounted on said valve element and respectively communicating with said first and second supply passages, first and second drain wells in said housing, and means for moving said valve element between a first position in which said first nozzle is directed towards said surface, said chamber communicates with said first drain well and is isolated from said second drain well and said second nozzle communicates with said second drain well, and a second position in which said second nozzle is directed towards said surface, said chamber communicates with said second drain well and is isolated from said first drain well, and said first nozzle communicates with said first drain well.

3,933,164

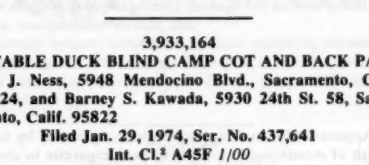
PORTABLE DUCK BLIND CAMP COT AND BACK PACK

Philip J. Ness, 5948 Mendocino Blvd., Sacramento, Calif. 95824, and Barney S. Kawada, 5930 24th St. 58, Sacramento, Calif. 95822

Filed Jan. 29, 1974, Ser. No. 437,641

Int. Cl.² A45F *1/00*

U.S. Cl. 135—1 R **1 Claim**



1. A combined duck blind, cot and back pack comprising a plurality of relatively rigid frame sections having telescoping side frame members, a plurality of generally U-shaped legs integrally connecting each of said frame sections and extending generally parallel to each other, a canvas support secured to said frame sections for supporting an occupant, spring urged latch and recess means on said frame sections for locking said frame sections in extended position, a fabric cover

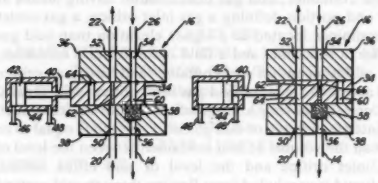
member to cover the entire cot detachably secured to said device with said cover member being hinged parallel to the longitudinal axis of the cot at regular spaced intervals along the entire length of the device to permit the cover to be moved into and out of covering position with respect to said device, a plurality of telescopically collapsible related frame sections forming said cover member, and a plurality of clamping members attached to said cover, each clamping member adapted to releasably attach to a plurality of cot frame members.

3,933,165

APPARATUS FOR OCTANE MONITORING

Paul A. Budzak, Cheswick, and Russell M. Clinton, III, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 20, 1974, Ser. No. 499,060
Int. Cl.² G01N *1/00*; F16K *11/06*
U.S. Cl. 137—625.48 **5 Claims**



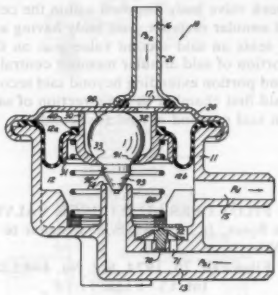
1. Apparatus for charging a gasoline stream to a reactor in which the gasoline is mildly reacted with an oxygen-containing gas for monitoring the octane number of the gasoline, comprising a sampling valve including a first guide block having a guide surface, a second guide block spaced from the first guide block and having a guide surface spaced from and parallel to the guide surface of the first guide block, a slider block between the guide blocks constructed and arranged to slidably and sealingly engage the guide surfaces on the first guide block and second guide block, gasoline circulating passages through each of the guide blocks opening through the guide surfaces thereof, a carrier gas passage extending through the first guide block and opening through the guide surface thereof, a sample delivery passage through the second guide block opening at the guide surface thereof, a gasoline sampling passage through the slider block constructed and arranged to communicate with the gasoline circulating passages when the slider block is in a gasoline circulating position, a carrier gas passage through the slider block spaced from the gasoline sampling passage oriented whereby the carrier gas passage in the slider block communicates with the carrier gas passage in the first guide block and the sample delivery passage in the second guide block when the slider block is in the gasoline circulating position, means connected to the slider block for periodically moving the slider block from the gasoline circulating position to a sample delivery position placing the gasoline sampling passage in the slider block in communication with the sample delivery passage in the second guide block and the carrier gas passage in the first guide block, a chamber of large volume and cross-sectional area relative to the volume and cross-sectional area of the gasoline sampling passage adjacent the guide surface of the second guide block forming a part of the sample delivery passage in the second guide block, and wicking means in the chamber.

3,933,166

ALTITUDE COMPENSATED VACUUM REGULATING VALVE

Richard H. Gould; George Ludwig, both of Troy; William J. Walters, Milford, and Remy J. VanOphem, Sterling Heights, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 468,859, May 10, 1974. This application Mar. 17, 1975, Ser. No. 559,182
Int. Cl.² G05D *7/00*
U.S. Cl. 137—102 **1 Claim**



1. A vacuum regulating valve comprising:

a cup shaped housing having a cavity with one open end and an opposite closed end, said housing including:

a first conduit disposed within said cavity, said conduit having one end portion extending into said cavity through said opposite closed end of said housing, an opposite end portion protruding from said cup shaped housing, and a first passage communicating with said cavity, said one end portion of said conduit having a first valve seat, said opposite end portion adapted to receive a vacuum source signal;

a second conduit passage having one end portion protruding from said housing cavity and a second passage adapted to communicate with said housing cavity, said one end portion adapted to provide an output signal;

a third passage disposed in said opposite closed end, one end of said passage communicating with said cavity and an opposite end communicating with said first passage of said first conduit;

an annular member coaxially disposed in said cavity, said member having a central passage with one end portion having a narrowed inside diameter adapted to provide a second valve seat and an opposite end portion having an inside diameter larger than said one end inside diameter, said one end portion also having an annular groove coaxially disposed with respect to said central passage;

a circular diaphragm having an outside diameter portion and an inside diameter portion, said outside diameter portion adapted to be mounted to the open end of said housing cavity and said inside diameter portion adapted to be mounted to said annular member, whereby the cavity within said housing is separated into a first and second pressure chamber;

a cover member adapted to be mounted over the open end of said housing cavity and the outside diameter portion of the diaphragm, said cover having a passage adapted to communicate with the central passage of said annular member;

means for biasing said annular member a predetermined amount in a first direction toward said cover, said means disposed between said opposite closed end of said housing cavity and said annular groove in one end of the annular member, whereby the force generated by the

biasing means moves said annular member in said first direction against said cover member;

a fourth conduit passage coaxially disposed with said second passage through said cover member, said conduit having one end extending in a direction away from the open end of said cavity, an opposite end portion adjacent said cover and means for mounting said opposite end to said cover member;

an umbrella-shaped check valve disposed in said third passage of the cup shaped housing, said check valve adapted to permit air flow in a direction from said first passage to said cavity and to prevent air flow in a second opposite direction; and

a ball-check valve body disposed within the central passage of said annular member, said body having a first portion which seats on said second valve seat on the narrowed end portion of said annular member central passage and a second portion extending beyond said second valve seat into said first chamber in the direction of said first valve seat on said one end of said first conduit.

3,933,167

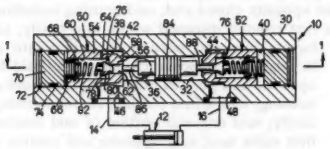
PILOT OPERATED CHECK VALVE

James Otto Byers, Jr., Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Feb. 20, 1974, Ser. No. 444,128

Int. Cl.² F16K *11/18*

U.S. Cl. 137—106 **4 Claims**



1. A pilot operated check valve comprising:

a valve body having a longitudinally extending bore,

a chamber at each end of said longitudinal bore,

a pair of fluid flow passages connected to said longitudinal bore,

a fluid flow port connected to each of said chambers,

a poppet valve in each of said chambers for preventing flow of fluid from said chamber into said longitudinal bore, each poppet valve including a hollow tubular valve member having a reduced diameter section closing one end of said valve member and a spring for continuously biasing said reduced diameter section into sealing engagement with the end of said bore, the cross sectional area of the valve member between the reduced diameter section and the outside diameter of the valve member being exposed to the pressure of the fluid in the flow port,

means in said poppet valve for providing restricted fluid flow across said poppet valve,

a check valve in each of said valve members to control the flow of fluid from said valve members to said longitudinally extending bore,

and a piston positioned in said longitudinal bore between said pair of fluid flow passages, said piston responding to fluid pressure at one end of said bore and including means for opening the check valve at the opposite end of said bore whereby the drop in pressure in the valve member on opening the check valve will allow the pressure of the fluid in the flow port to open the corresponding poppet valve against said bias.

3,933,168

LIQUID CLOSURE DEVICE

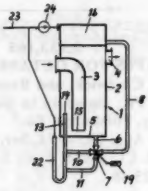
Georg Michael Meyer, Brookfield, Conn., assignor to Georg Michael Meyer, Brookfield, Conn.

Filed Dec. 11, 1973, Ser. No. 423,668

Claims priority, application Germany, Dec. 13, 1972, 2260874

Int. Cl.² F16L *9/00*

U.S. Cl. 137—253 **1 Claim**



1. A liquid closure device for an inert gas comprising an upright container, a gas inlet means for conducting gas to said container, a vertical gas inlet conduit joined to said gas inlet means, said vertical gas inlet conduit being vertically disposed within said container, said gas inlet conduit having means at its lower end portion defining a gas inlet orifice, a gas outlet on said container located at a higher elevation than said gas inlet orifice, a fluid inlet and a fluid outlet for said container, an efflux outlet means on said container and having an orifice disposed above the level of said gas inlet orifice, said vertical gas inlet conduit having a longitudinal length selected such that the internal volume of said gas inlet conduit is equal to or greater than the volume of said container between the level of said gas inlet orifice and the level of said efflux orifice, whereby liquid is precluded from flowing through said vertical gas inlet conduit to said gas inlet means as a result of a higher pressure in said container relative to said gas inlet means, a fluid reservoir disposed above said container and having a capacity to fill said container above the level of said gas inlet orifice, a fluid conduit leading from said reservoir to said fluid inlet, valve means in said fluid conduit for controlling the flow of fluid from said reservoir to said container, said valve being closed during normal operating conditions of the liquid closure device such that that said container is empty of fluid and said gas flows freely from said container gas inlet to said container gas outlet, said valve being opened when it is desired to effect a seal such that upon opening of said valve, fluid will flow by gravity from said reservoir to said container to a level above the level of said gas inlet orifice to thereby effect the seal by the gravity flow of said fluid and thereby preclude flow of gas from said container to said gas inlet conduit, water inlet means for said reservoir, said efflux outlet means comprising an efflux conduit connected to said water inlet means, and a pump in said water inlet means between said container and the connection between said efflux conduit and said water inlet means whereby there is provided a closed system in which said water is recirculated.

3,933,169

JET ACTION CHEMICAL FEEDING APPARATUS

James L. Halley, Mableton, Ga., assignor to Tesco Chemicals, Inc., Marietta, Ga.

Filed Apr. 10, 1975, Ser. No. 566,833

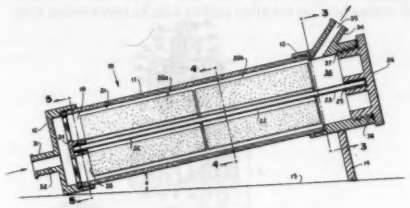
Int. Cl.² E03C *1/046*; C02B *1/36*; E04H *3/20*

U.S. Cl. 137—268 **8 Claims**

1. Apparatus for feeding a chemical into a liquid by directing liquid against a soluble chemical composition, comprising:

body means defining a chamber for receiving a solid body of the soluble chemical composition, said chamber having a longitudinal dimension and being positioned for support on a horizontal surface with said longitudinal chamber disposed at an incline with respect to the horizontal;

liquid inlet means in said body means in liquid flow communication with the lower end of said inclined chamber; and fluid outlet means in said body means in fluid flow communication with the uppermost location within said inclined



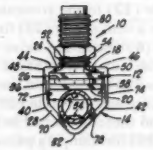
chamber means to permit the gaseous fluid produced by dissolution of the chemical composition in said inclined chamber to exit through said fluid outlet means without being entrapped within said inclined chamber.

3,933,170

APPARATUS FOR SECURING A LINE TAP VALVE TO THE EXTERIOR OF A TUBING LINE

John W. Olson, Jr., Oklahoma City, Okla., assignor to C & D Valve Manufacturing Company, Oklahoma City, Okla.

Filed Mar. 20, 1975, Ser. No. 560,563
Int. Cl.² B23B *41/08*; F16L *41/04*
U.S. Cl. 137—318 **13 Claims**



1. Apparatus for securing an externally threaded line tap valve to the exterior of a penetrable tubing line having any one of a plurality of outside diameters, comprising:

a body member having first and second end faces and an internally threaded longitudinal passage extending therethrough communicating the first and second end faces;

a first cylindrical outer surface formed on said body member adjacent to the first end face thereof and coaxial with the passage therethrough;

a second cylindrical outer surface formed on said body member intermediate said first cylindrical outer surface and the second end face of said body member and coaxial with the passage therethrough;

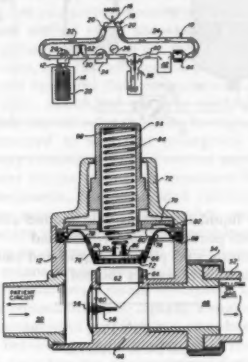
bifurcated spring clip means having opposite ends for partially encircling the exterior of a penetrable tubing line and having notch means formed on the opposite ends thereof for yieldably releasably mutually engaging said first cylindrical surface and, alternately engaging said second cylindrical surface and securing said body member to the exterior of the tubing line with the second end face adjacent to the exterior of the tubing line and, alternately, with the first end face adjacent to the exterior of the tubing line.

3,933,171

ANESTHESIA BREATHING CIRCUIT WITH POSITIVE END EXPIRATORY PRESSURE VALVE

Wayne W. Hay, Madison, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 9, 1974, Ser. No. 459,437
Int. Cl.² A61M *17/00*
U.S. Cl. 137—493.7 **6 Claims**



1. In a patient breathing circuit having gas delivery means for forcing inhalation anesthesia gas to, and receiving exhalation gas from the patient, the improvement comprising a valve that is connected between said gas delivery means and the remainder of the breathing circuit for retaining positive residual pressure in the breathing circuit at the end of patient exhalation, said valve comprising a housing having an inlet for connection to said gas delivery means, and an outlet for connection to the remainder of the breathing circuit, said inlet and outlet being interconnected within the housing by first and second parallel gas flow paths, a check valve in said first gas flow path adapted to pass gas only in a direction from said gas delivery means into the breathing circuit during patient inhalation, and a pressure operated valve in said second gas flow path that is opened in response to delivered gas pressure during inhalation and is spring-biased to close when the pressure within the second gas flow path drops below a predetermined minimum value of positive pressure during patient exhalation.

3,933,172

PIPELINE SURGE RELIEVER WITH SANITARY BARRIER

Donald M. Allen, Pinole, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Feb. 24, 1975, Ser. No. 552,559
Int. Cl.² F16K *31/126*, *31/365*
U.S. Cl. 137—494 **10 Claims**

1. In a pressure surge relief system for a liquidtransporting pipeline including:

an accumulator for transferring the pressure of the liquid in a pipeline to a gas; and

a pilot load duct connected between said pipeline and said accumulator;

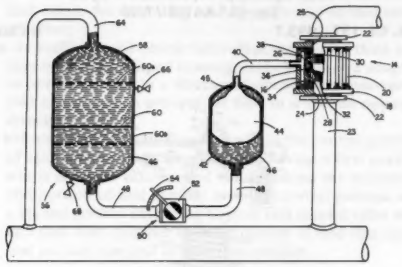
means for isolating the interior of said accumulator from the liquid in the pipeline comprising:

a barrier fluid vessel connected into said pilot load duct;

a first connection of the pilot load duct opening from a first portion of said fluid vessel to said accumulator; and

a second connection opening from another portion of said fluid vessel to said pipeline;

a relatively inert liquid occupying said accumulator, said first connection and said first portion of said vessel;



the pipeline liquid occupying said second connection and said another portion of said vessel; and

means separating said pipeline liquid and said inert liquid while equalizing pressures thereof.

3,933,173

CHECK VALVE

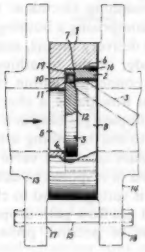
Yoshio Kajita, Tokyo, Japan

Continuation of Ser. Nos. 148,156, May 28, 1971, abandoned, and Ser. No. 766,388, Oct. 10, 1968, abandoned. This application Sept. 17, 1973, Ser. No. 398,168

Claims priority, application Japan, Feb. 26, 1968, 43-11824

Int. Cl. F16k *15/03*

U.S. Cl. 137—527.8 **1 Claim**



1. In a check valve comprising a valve body having a stepped bore providing an inlet bore, an outlet bore of greater diameter than said inlet bore and a wall extending laterally of and between said inlet and outlet bores, providing a valve seat, a circular valve support having its periphery detachably mating with said outlet bore and an end face positioned against said valve body wall, said valve support having a bore of a greater diameter than said inlet bore, a disc valve being of a smaller diameter than and positioned in said valve support bore and being of greater diameter than said inlet bore, the improvement in which said valve support end face has a straight slot thereacross facing said valve body wall, the axis of said slot being tangential to the bore in said support, and a shaft attached tangentially at the surface of said shaft to a portion of the periphery of said disc valve and being seated in said valve support slot pivotally supporting said disc valve for flap movement to and from said wall for closing and opening said inlet bore.

3,933,174

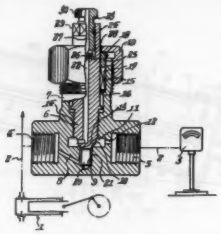
VALVE WITH A PULSATION DAMPING DEVICE

Kunihiko Kanomata, Aikawa, Japan, assignor to Sanko Engineering & Construction Co., Ltd., Yokohama, Japan

Filed May 20, 1974, Ser. No. 471,576

Int. Cl.² F16K *37/00, 31/50*

U.S. Cl. 137—557 **1 Claim**



1. A valve with a pulsation damping device comprising a valve body (7) formed in T-form, said valve body (7) containing a first opening (4) coupled with a pulsating fluid, a second opening (5) coupled with a pressure gauge (3) and a truncated valve stem (6) opening and closing a connection between the first opening (4) and the second opening (5), a valve seat (10) formed in the valve body (7), said valve seat (10) being opened and closed by said truncated valve stem (6), a cylindrical hole (9) formed beneath said valve seat (10) in the valve body (7), the lower end of said cylindrical hole (9), being connected to the first opening (4), a small chamber (11) formed above said cylindrical hole (9) in the valve body (7), said small chamber (11) being connected to the second opening (5), a main exhaust hole (22) formed through said truncated valve stem (6), on end of said main exhaust hole (22) being opened in said small chamber (11), a valve seat (25) and a small chamber (28) both formed at another end of said main exhaust hole (22) in the truncated valve stem (6), a tapped hole (24) for a vent screw (23) formed through said truncated valve stem (6) above the valve seat (25) and the small chamber (28), an auxiliary exhaust hole (27) formed through the vent screw (23) screwed in the tapped hole (24), one end of said auxiliary exhaust hole (27) being opened in the air and another end thereof opened in the small chamber (28), and a cylinder (20) for damping pulsation formed in the cylindrical hole (9) at the lower end of said valve stem (6), said cylinder (20) being unified with said truncated valve stem (6) and being movable in the longitudinal direction of said cylindrical hole (9) so as to have the resistance thereof proportional to the distance of the movement in the longitudinal direction of said cylinder (20).

3,933,175

SNIFTER VALVE USEFUL IN CONTROL MEANS FOR A PISTON IN A CYLINDER

Joseph H. Klaeger, 610 Chauncey, Apt. No. 2, San Antonio, Tex. 78216

Filed Dec. 5, 1973, Ser. No. 421,844

Int. Cl.² F16K *31/12*

U.S. Cl. 137—595 **6 Claims**

1. In the controlled means for pneumatic actuated piston in a pumping cylinder the sub-combination of a snifter valve comprising:

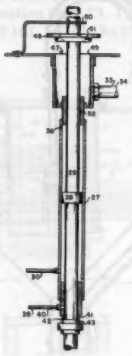
a. an elongated cylindrical snifter cylinder projecting on an axis from a first end to the second end,

b. a snifter rod mounted for longitudinal reciprocal movement on the axis of said snifter cylinder,

c. a bleeder vent constructed in a first end of said snifter valve, said bleeder vent adapted to move alternately from an open to a closed position responsive to the movement of said snifter rod along the axis of said cylinder,

d. pneumatic pressure closing means applied internally of said snifter cylinder for normally urging said snifter rod into a position urging said bleeder vent into contact with closing means secured to said first end of said snifter cylinder,

e. a brake disc having a pumping cylinder side and a brake seat side, said brake disc slidably mounted externally of said second end of said snifter cylinder on said snifter rod,



said brake disc constructed and arranged to move from an open position not in contact with said snifter cylinder to a braking position in contact with,

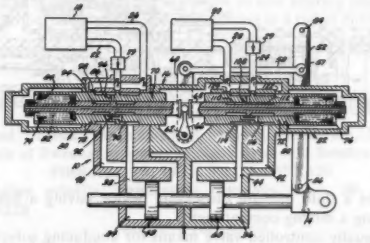
f. a brake seat secured to said second end of said snifter cylinder adapted to be contacted by said brake disc thereby stopping the flow of gas from said pumping cylinder responsive to the movement of said brake disc to a braking position.

3,933,176

FAIL OPERATIVE SPLIT TANDEM VALVE

Mildred S. Wheeler, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed July 12, 1974, Ser. No. 488,036
Int. Cl.² F15B *20/00*
U.S. Cl. 137—596 **3 Claims**



1. A fail operative valve for simultaneous valving in two separate systems including:

a valve housing having first and second portions, said first housing portion having an inlet for pressurized fluid, at least one outlet for fluid return and a pair of ports for feeding the fluid to and from actuator means, said second housing portion having an inlet for pressurized fluid, at least one outlet for fluid return and a pair of ports for feeding the fluid to and from actuator means;

a first valve slide positioned in said first housing portion adjacent said first housing portion inlet, outlet and ports, said first valve slide having first and second annular passageways which are the only annular passageways therein, said first and second passageways normally valving said hydraulic fluid between said first housing portion inlet, outlet and ports to operate the actuator means, said first valve slide also having a third passageway connected to said first passageway and a fourth passageway connected to said second passageway;

a second valve slide positioned in said second housing portion adjacent said second housing portion inlet, outlet and ports, said second valve slide having first and second annular passageways which are the only annular passageways therein, said first and second passageways normally valving said hydraulic fluid between said second housing portion inlet, outlet and ports to operate the actuator means, said second valve slide also having a third passageway connected to said first passageway and a fourth passageway connected to said second passsageway; and

bypass driver means having a connection for mechanical input commands, first preloaded resilient means connected to move said first valve slide with said bypass driver means in response to the mechanical input commands up to a predetermined force, second preloaded resilient means connected to move said second valve slide with said bypass driver means in response to the mechanical input commands up to a predetermined force, a first pair of passageways positioned to complete a bypass flow channel between said first valve slide third and fourth passageways when the predetermined force is exceeded and said bypass driver means are moved by said mechanical input with respect to said first valve slide, and a second pair of passageways positioned to complete a bypass flow channel between said second valve slide third and fourth passageways when the predetermined force is exceeded and said bypass driver means are moved by said mechanical input with respect to said second valve slide, said first and second passageways of said first and second valve slides being positioned to always be in communication with said pair of ports for feeding fluid to and from the actuator means so a jam of one of said valve slides to said valve housing cannot produce hydraulic lock of the actuator means and said first and second valve slides having concentric inner and outer cylindrical surfaces, said first and second passageways thereof being annular channels in said outer cylindrical surfaces and said bypass driving means being positioned in contact with said inner cylindrical surfaces, said bypass driver means having at least one cylindrical outer surface, said first pair of passageways of said bypass driving means being annular channels in said cylindrical outer surface thereof, said fourth passageways of said first and second valve slides being positioned to always be in communication with said pairs of passageways in said bypass driving means and said third passageways of said first and second valve slides being positioned to be in communication with said pair of passageways in said bypass driving means only when the preload of said respective preloaded resilient means is exceeded.

3,933,177

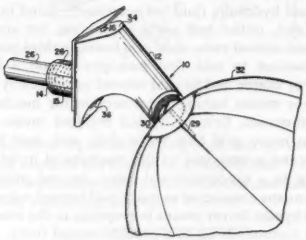
MANUALLY CONTROLLED AIR INFLATOR ADAPTOR

John Robert Dwyer, Jr., Excelsior, Minn., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 23, 1973, Ser. No. 408,923
Int. Cl.² F16K *41/02*
U.S. Cl. 137—608 **1 Claim**

1. A manual, hand-held air inflator adaptor comprising a one-piece molded plastic body having an inlet port, a bleed port, and a discharge port; a flat external surface encompassing said bleed port; said inlet port and said discharge port being substantially equal in cross sectional area, and said

bleed port being substantially smaller than said discharge port in cross sectional area; a first passageway extending longitudinally through said body from said bleed port to said discharge port, said first passageway being tapered so as to form a smooth-walled surface increasing in cross sectional size from said bleed port to said discharge port to cause the total force exerted by compressed air within said body to be substantially larger at said discharge port than it is at said bleed port; second passageway means extending internally of said body from



said inlet port to said first passageway means to allow a normal flow of air from said inlet port into said second passageway and through said discharge port when the pressure externally of said discharge port is lower than that at said inlet port; said flexible closure means mounted externally on said body, said closure means including a planar sealing portion positioned adjacent said bleed port for pivotal movement by an operator into sealing engagement with said flat surface about said bleed port to cause the full pressure of compressed air at said inlet port to be applied to said discharge port.

3,933,178

METERING APPARATUS FOR LIQUIDS CONTAINING GRANULAR SOLIDS, IN PARTICULAR LAPPING LIQUID

Edmund Eich; Ewald Weber; Heinz Gerner, all of Coburg, and Rudolf Merkel, Coburg-Scheuerfeld, all of Germany, assignors to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg, Germany

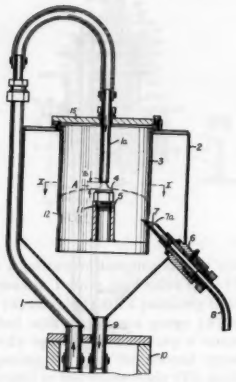
Filed Sept. 9, 1974, Ser. No. 504,532

Claims priority, application Germany, Sept. 14, 1973, 2346325

Int. Cl.² F17D *3/10*

U.S. Cl. 137—608 **11 Claims**

1. A metering apparatus for liquids containing granular solids, in particular lapping liquid, comprising: a collecting pipe adjustable transversely of a stream of liquid issuing from a feed pipe for the metering of the liquid, said collecting pipe having its collecting opening disposed transversely of the stream of liquid and immersed therein, converting means for converting said stream of liquid issuing from said feed pipe over a wide area against a substantially vertical wall to run down thereon in the form of a thin film of uniform thickness, said collecting pipe being arranged essentially on a side of the wall which is remote from said liquid film, said wall having a through orifice therein in its lower zone for receiving a free end of said collecting pipe therein, said free end extending upward of said collecting pipe, said collecting opening having



a cross-section which widens with progressive movement of said collecting pipe into said through orifice.

3,933,179

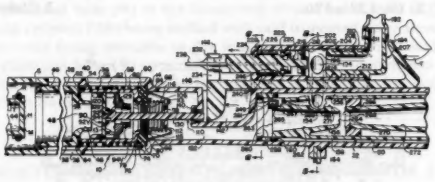
WATER AND CONCENTRATE SUPPLY VALVES FOR PROPORTIONING MIXER-DISPENSER

Valentine Hechler, IV, 26 Meadow View, Northfield, Ill. 60093

Filed Feb. 27, 1974, Ser. No. 443,831

Int. Cl.² F16K *19/00*

U.S. Cl. 137—635 **10 Claims**



1. In a fluid mixture dispensing device having a housing defining a mixing compartment;

manually controlled valve means for conducing solvent to said compartment;

valve means for conducting solute to said compartment;

solvent flow control valve means between said compartment manually controlled valve means biased to close at a comparatively low positive gauge pressure upon the solvent;

negative gauge pressure responsive means normally closing said solute valve means under a negative gauge pressure; and

manual means actuating the solvent valve means independently and the solute valve means selectively simultaneously therewith.

3,933,180

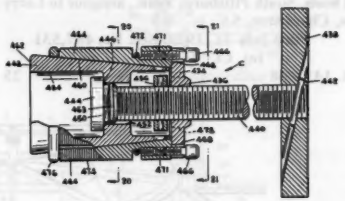
METHODS AND APPARATUS FOR MAKING FIBER REINFORCED PLASTIC PIPE

J. Warne Carter, Wichita Falls, Tex., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 243,991, April 14, 1972, which is a division of Ser. No. 824,153, May 13, 1969, Pat. No. 3,700,519, which is a continuation-in-part of Ser. No. 577,035, Sept. 2, 1966, Pat. No. 3,507,412, which is a continuation-in-part of Ser. No. 387,372, Aug. 4, 1964, abandoned. This application Oct. 23, 1973, Ser. No. 408,339

Int. Cl.² F16L *55/12*; B65D *39/12*

U.S. Cl. 138—89 **2 Claims**



1. A device for sealing the end of a pipe comprising a bearing plate having a central, internally threaded opening, a solid threaded shaft extending through said opening to clamp and unclamp the device from a pipe, manually operable means for rotating the shaft, the forward end of the shaft having a disk fixed thereto of a larger diameter than the diameter of the shaft, an O-ring positioned adjacent the rear side of the disk, a hollow plug having a central bore, said O-ring being cooperable with the wall of said bore, said plug having a counterbore to receive said disk, the intersection of the bore and counterbore providing a shoulder cooperable with said disk in the clamped position of the device, whereby the O-ring is in sealing engagement with the bore's wall, the outer side of said plug being convergingly tapered toward said bearing plate to provide a ramp, a plurality of segments providing a split, expandable sleeve overlying said plug, said segments being matingly tapered on their inner sides for cooperation with said ramp, the segments being provided on their outer sides with means for gripping the interior of a pipe, an elastic retaining ring to resiliently maintain said segments against the underlying plug, and means connecting the segments to said bearing plate in a manner permitting the segments to move in a radial direction.

3,933,181

LONG DISTANCE HEATING CONDUIT IN PARTICULAR FOR HOT WATER LINES

Erland Nilsson, Torshalla, and Lennart Lundbohm, Nacka, both of Sweden, assignors to Nyby Bruk AB, Sweden

Filed Apr. 19, 1973, Ser. No. 352,420

Claims priority, application Germany, Apr. 20, 1972, 2219228

Int. Cl.² F16L *58/00*

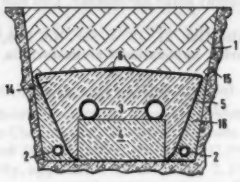
U.S. Cl. 138—105 **32 Claims**

24. An underground hot fluid conveying tube arrangement comprising:

at least one tube means for conveying hot fluid,

at least one cover means surrounding said tube means for protecting said tube means from corrosive media,

wherein at least a portion of said at least one cover means includes holes of sufficient size to be permeable to gases and vapors of said corrosive media to permit passage of said gases and vapors from inside said cover means to the outside thereof, but impermeable to liquid states of said corrosive media to prevent passage of the liquid corrosive media from outside said cover means to the inside thereof,



and insulating means between said tube means and said cover means for insulating said tube means.

3,933,182

SYSTEM FOR SEALING AND HEAT-INSULATING A DUCT CONTAINING A HOT FLUID UNDER PRESSURE

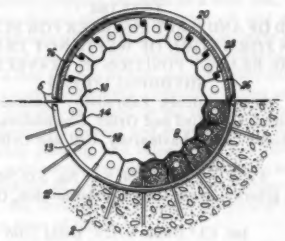
Didier Costes, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 5, 1974, Ser. No. 440,136

Claims priority, application France, Feb. 6, 1973, 73.04169

Int. Cl. F16l *5/02*

U.S. Cl. 138—149 **7 Claims**



1. A system for sealing and heat-insulating a duct which contains a hot fluid under pressure and is limited by a cold structure surrounding the duct, wherein said system comprises:

an internal duct lining of rigid heat-insulating material,

a cylindrical sheet-metal element of corrugated transverse section having wave troughs within and completely covering said heat-insulating lining, said lining being provided with the same corrugations as said sheet-metal element,

means for anchoring said sheet-metal element in the cold structure and disposed along radii of said duct, each of the means aforesaid being secured at one end thereof to one wave trough of said sheet-metal element and at the other end thereof to said cold structure.

3,933,183

METHOD OF AND WEFT INSERTER FOR ELIMINATING A CHAIN FORMATION OF WEFTS NOT TRANSFERRED INTO THE BEAT-UP POSITION IN TRAVELLING-WAVE SHEDDING LOOMS

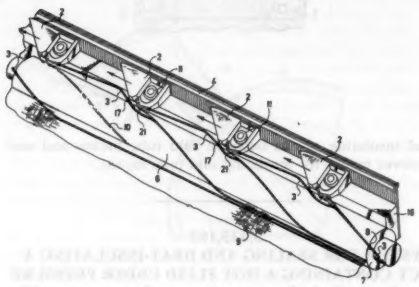
Vladimir Mateju; Zdenek Zabrodsky; Vitezslav Vasek, and Frantisek Jekl, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 21, 1974, Ser. No. 516,733

Claims priority, application Czechoslovakia, Oct. 24, 1973, 7322-73

Int. Cl.² D03D *47/24*; D03J *5/06*

U.S. Cl. 139—12 8 Claims



1. Method of eliminating a chain formation of wefts not transferred into the beat-up position in a travelling-wave shedding loom with weft inserters and a rotary seed comprising discs with cutouts for engaging weft and displacing it to the fabric fell, the method comprising introducing an interwoven but not transferred weft into the cutouts of the discs of the rotary reed which correspond to the next weft inserter, in lieu of the weft from said next weft inserter.

3,933,184

METHOD OF AND WEFT INSERTER FOR ELIMINATING A CHAIN FORMATION OF WEFTS NOT TRANSFERRED INTO THE BEAT-UP POSITION IN TRAVELLING-WAVE SHEDDING LOOMS

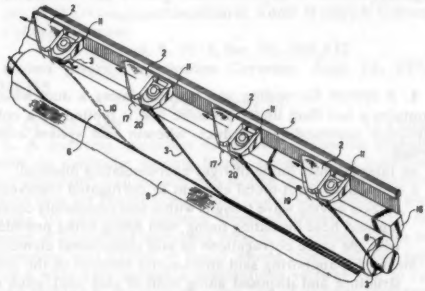
Vladimir Matěju; Zdeněk Zábrodský; Vitezslav Vašek, and Josef Bleha, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 22, 1974, Ser. No. 516,907

Claims priority, application Czechoslovakia, Oct. 24, 1973, 7324-73

Int. Cl.² D03D *47/24*; D03J *5/06*

U.S. Cl. 139—12 5 Claims



1. Method of eliminating a chain formation of wefts not transferred into its beat-up position due to the presence of a foreign body interwoven in the weaving shed in a travelling-wave shedding loom provided with a plurality of weft inserting means travelling one after the other into said weaving shed, the shed being closed behind each inserting means and after having been exchanged, being open in front of each weft inserting means, the loom being provided with a rotary reed consisting of discs having cutouts for engaging weft inserted by said weft inserting means into the weaving shed and for displacing it to the fabric fell into the beat-up position, said method comprising severing the weft laid upstream of the interwoven foreign body beyond the reach of the discs of said rotary reed.

3,933,185

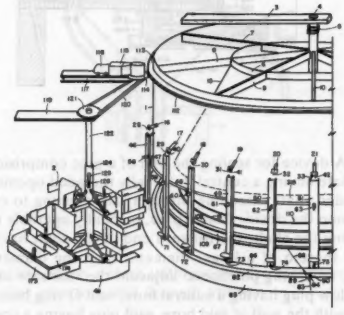
SPILL COLLECTION DEVICE

Harold Seals, South Pittsburg, Tenn., assignor to Larry Harold Kline, Charleston, S.C.

Filed July 11, 1974, Ser. No. 487,531

Int. Cl.² B65B *3/04*, *1/04*

U.S. Cl. 141—88 25 Claims



1. A split collection device, for a revolving machine which bags material, comprising:

a. material landing means located below the position in said revolving machine where said material is bagged, whereby excess material will fall onto said material landing means;

b. material collection means mechanically operative in accordance with said revolving machine to collect said excess material which falls onto said material landing means;

c. material return means operative to return said excess material which falls onto said material landing means to said revolving machine.

3,933,186

PROTECTIVE HOUSING FOR A LIQUID SAMPLE CONTAINER

Norman E. Scheffler, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 3, 1973, Ser. No. 421,210

Int. Cl.² B65H *3/18*; F16P *1/00*

U.S. Cl. 141—97 1 Claim

1. A protective housing unit for a liquid sample container, which comprises the combination of:

an outer housing section defined by a cylindrical section which has a single side wall, an open top, a bottom which connects into a drain line, and an opening in the side wall;

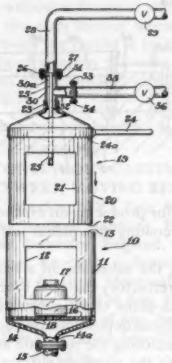
a support plate for supporting a liquid sample container, the plate being positioned within the outer housing section near the bottom of the section;

an inner housing section defined by a cylindrical section which has a single side wall, an open bottom, an open top, and an opening in the side wall, the inner section being positioned within the outer housing section, and the inner section being rotatable within the outer housing section;

a tee fitting which has an upper end in communication with a liquid inlet line, which has a lower end in communication with the open top of the inner housing section, and which has a branch end in communication with a vent line;

a fill pipe which is positioned lengthwise within the tee fitting, such that an annular space is defined between the fill pipe and the tee fitting, the fill pipe having an open upper end in communication with the liquid inlet line and an open lower end which extends into the sample container, the annular space defining a passageway for diverting vapors from the sample container into the vent line;

the inner housing section being rotatable to a first position which will seal the opening in the outer housing section and enclose the sample container, and to a second position in which the opening of the inner housing section will be in alignment with the opening of the outer housing section, to permit the sample container to be inserted and removed from the said housing unit.

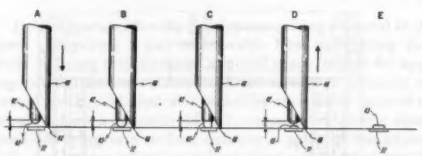


3,933,187

CONTROLLED EPOXY DISPENSING TECHNIQUE AS RELATED TO TRANSISTOR CHIP BONDING

Edward J. Marlinski, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Mar. 5, 1974, Ser. No. 448,330
Int. Cl.² B67D *1/00*; G01F *11/00*
U.S. Cl. 141—392 **3 Claims**



1. In combination with an epoxy bonding machine of the type including a tubular dispenser movable in a substantially vertical direction and having at one end thereof a pressure activated tubular dispensing tip for dispensing upon a substantially horizontal surface conductive epoxy in the substantially vertical direction generally along the longitudinal axis of the dispenser, an improvement comprising:

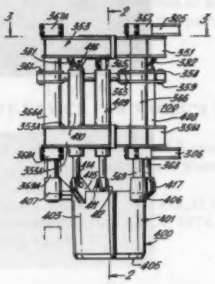
generally annular spacing means attached to the dispenser, movable in the substantially vertical direction, having an inner surface spaced a substantially constant distance laterally from and extending generally parallel to the outer surface of the dispenser, having a longitudinal axis which is substantially coincident with the longitudinal axis of the dispenser and including a generally annular spacing means end surface which is substantially parallel to the end of the dispensing tip and which extends a predetermined gap distance substantially in the vertical direction beyond the end of the dispenser such that during dispensing said predetermined gap exists between said dispensing tip and said horizontal surface.

3,933,188

ROOT SHEAR FELLER

Joseph J. R. Boivin, Montreal, Canada, assignor to Logging Development Corporation, Montreal, Canada

Filed July 26, 1974, Ser. No. 491,993
Claims priority, application Canada, Aug. 2, 1973, 178004
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 R **19 Claims**



1. A device for cutting appendages projecting from the stem of a tree such as roots or the like comprising in combination:

a. a frame;

b. a grapple having arms movably mounted on said frame for positively gripping the stem of a tree; and

c. a cutting device movably mounted on said grapple in spaced relation relative thereto for movement in a direction toward and away therefrom longitudinally along the stem of a tree grasped by said grapple, said cutting device having a cutting member connected to an arm of the grapple movably mounted on the frame for movement in unison therewith toward and away from the stem of the tree during grasping and releasing of the same by said grapple, said cutting member having a cutting edge facing longitudinally of the stem of the tree grasped by the grapple for severing appendages projecting outwardly from the stem of the tree.

3,933,189

NOISE REDUCING PLANER CUTTER HEAD

Charles L. Boles, and Richard J. Flanigan, both of McMinnville, Tenn., assignors to Powermatic/Houdaille, Inc., McMinnville, Tenn.

Filed Sept. 9, 1974, Ser. No. 504,564
Int. Cl.² B27C *1/14*
U.S. Cl. 144—117 R **8 Claims**

1. A planer cutterhead comprising a cutterhead member having an axially elongated cylindrical portion, the cylindrical portion provided with a plurality of circumferentially spaced blade grooves extending into the cutterhead from the periphery thereof, the grooves extending continuously from adjacent one axial end to adjacent the other axial end, and having a circumferential dimension to receive a cutting blade, a plurality of cutting blades received in each groove in axially spaced relation to one another, the cutting blades in circumferentially adjacent grooves being axially staggered with respect to the

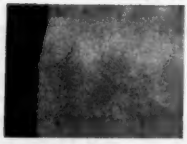
blades in adjacent grooves, and means securing the blades in the grooves.

3,933,190

METHOD FOR FABRICATING SHELL MOLDS FOR THE PRODUCTION OF SUPERALLOY CASTINGS

Michael H. Fassler, Portland, and James S. Perron, Chester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1974, Ser. No. 533,374
Int. Cl.² B22C 9/04, 3/00
U.S. Cl. 164—26 6 Claims



1. A method for the fabrication of shell molds suited for use in the production of directionally solidified components made from nickel and cobalt base alloys, comprising the steps of

A. providing a pattern which duplicates the size and shape of the desired final product, said pattern being made of wax or similar material;

B. providing a slurry containing from 15 to 25 parts of an aqueous solution containing about 50% aluminum polyoxychloride, from 6 to 10 parts water, from 8 to 14 parts of a binding agent such as latex, from 25 to 35 parts of −325 mesh alumina, from 7 to 12 parts of −100 mesh alumina, from 10 to 20 parts of −38/+100 mesh alumina, and from 0.5 to 1.5 parts of a pH control agent such as a 2% aqueous solution of HCl;

C. dipping the pattern into the slurry so as to coat the pattern with the slurry;

D. drying the coated pattern;

E. dipping the coated pattern into the slurry and then applying dry −38/+100 mesh alumina;

F. drying the coated pattern;

G. dipping the coated pattern into ethyl alcohol, then into the slurry, and then applying dry −28/+48 mesh alumina;

H. drying the coated pattern;

I. repeating steps G and H a plurality of times;

J. removing the wax by heating the coated pattern to a temperature in excess of the melting temperature of the pattern material;

K. firing the mold at an elevated temperature to remove all pattern residue and consolidate the shell mold;

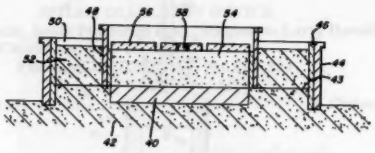
whereby the resultant shell mold is composed of substantially pure alumina and is resistant to attack by molten nickel and cobalt alloys during exposures of up to 12 hours.

3,933,191

METHOD FOR CONTAINING THE MOLTEN REACTION PRODUCTS OF A REACTIVE CLADDING PROCESS

Richard C. Adams, Pitcairn Borough, Allegheny County; Robert H. Kachik, Washington Township, Westmoreland County; Arthur J. Pignocco, Franklin Township, Westmoreland County, and Waldo Rail, Fox Chapel Borough, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 332,869, Feb. 15, 1973, Pat. No. 3,856,076. This application July 2, 1974, Ser. No. 485,193
Int. Cl.² B23K 23/00
U.S. Cl. 164—54 3 Claims



1. A method for producing an exothermic reduction-deposited metal clad coating on a planar surface of metal substrate, comprising:

a. supporting the substrate on a bed of a first particulate insulating refractory material extending around the substrate to the plane of the substrate surface to be clad;

b. forming a metal deposition zone defined by a solid refractory wall enclosing the substrate at the edges thereof and extending to the aforesaid surface plane;

c. surrounding the metal deposition zone with a second particulate insulating refractory material extending at least to said surface plane and providing a sealing medium flowable into any irregularities between said substrate and said solid wall and containing fluid cladding reaction products escaping therefrom during cladding, and

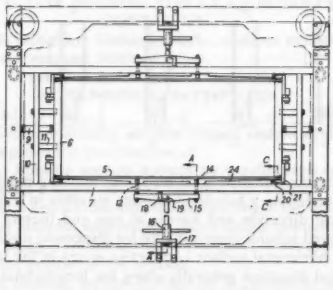
d. igniting a particulate exothermic cladding material on the substrate surface to be clad, thereby forming fluid cladding reaction products and cladding said metal substrate.

3,933,192

SEMI-CONTINUOUS CASTING METHOD FOR FLAT INGOTS

William Simon Rodenchuk, Montreal, and Anthony Garth Eccles, Oakville, both of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 30, 1974, Ser. No. 465,552
Claims priority, application United Kingdom, Apr. 30, 1973, 20553/73
Int. Cl.² B22D 11/16
U.S. Cl. 164—89 3 Claims



1. Procedure for direct chill semi-continuously casting a substantially rectangular-section metal ingot including the steps of

a. supplying molten metal to the inlet end of a mould having an open outlet end and a substantially rectangular passage therethrough and maintaining a head of molten metal in said mould during said casting operation,
b. cooling the mould for solidifying the peripheral portion of the metal therein,
c. advancing the ingot through the mould at a relatively low initial speed and then increasing the rate of advance of the ingot through the mould,
d. applying coolant directly to the surface of the ingot emerging from said mould,

wherein the improvement comprises increasing the gap at least between the mid-points of the opposed longer sides of the rectangular mould without substantial alteration of the gap between said sides at the ends thereof when the rate of advance of the ingot through the mould is increased above the relatively low initial speed whereby the sides of the solidified ingot are controlled to an acceptable condition of flatness throughout their length.

3,933,193
APPARATUS FOR CONTINUOUS CASTING OF METAL STRIP BETWEEN MOVING BELTS

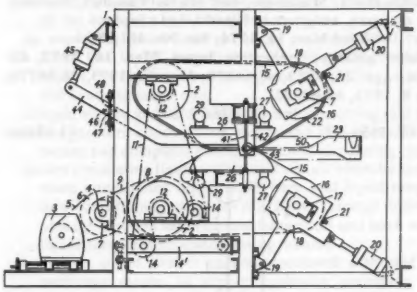
William Albert Baker, Mexico, N.Y.; Eric Arthur Wootton; Sidney Reginald King, both of Banbury, England; Donald Louis William Collins, Daventry, England, and George Edward Macey, Banbury, England, assignors to Alcan Research and Development Limited, Montreal, Canada

Continuation-in-part of Ser. No. 426,046, Dec. 19, 1973, abandoned, which is a continuation of Ser. No. 225,979, Feb. 14, 1972, abandoned. This application June 27, 1974, Ser. No. 483,836

Claims priority, application United Kingdom, Feb. 16, 1971, 4780/71; Feb. 3, 1972, 5187/72

Int. Cl.² B22D *11/06*

U.S. Cl. 164—146 **25 Claims**



1. An apparatus for the continuous casting of metal in strip form comprising a pair of movable heat conducting metal belts, defining therebetween a mould space, means for applying coolant to the reverse faces of said belts adjacent said mould space, said apparatus including at opposite faces of said mould space a plurality of belt supports at closely spaced positions lying in a surface defining a path for the adjacent belt, and means effective independently of head of metal in the mould space for applying to each of said belts during transit through said mould space an outwardly directed force in a direction perpendicular to the path of that part of the belt to hold the same in a closely defined path in contact with said belt supports, including means for applying a subatmospheric pressure to the rear surface of at least one of said belts during its transit through said mould space, said apparatus further comprising at said casting zone a system for the application of coolant and differential pressure to the reverse face of at least one of said belts, said system comprising a rigid casing, a belt contacting surface on the outside of said casing, an opening in said casing lying within and surrounded by said surface, an inlet plenum chamber separated from said opening by a first partition, a water inlet passage to said plenum chamber, a plurality of closely spaced jet orifices formed in said first partition, the axes of said jet orifices being at a large angle to the belt in contact with said belt contacting surface, an outlet plenum chamber separated from the inlet plenum chamber by a second partition, closely arranged belt support members being arranged in said opening and supported by said first partition, said support members being level with the surrounding belt contacting surface of the casing, recessed water passages lying between said support members, the said jet orifices opening into said water passages for directing individual closely spaced jets of water onto the reverse surface of the belt in the casting zone, drain passages leading from said water passages to said outlet plenum chamber whereby the application of suction to the outlet plenum chamber draws water into said inlet plenum chamber and directs closely spaced individual water jets onto the reverse surface of the belt and simultaneously creates reduced pressure conditions in said water passages between said belt support members to draw the belt against said support members to define the path of the belt through the casting zone.

3,933,194
PATTERN PLATE DEVICE FOR VACUUM SEALED MOLDING

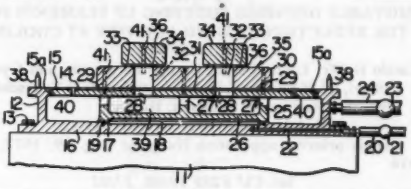
Itsuo Hijikata, Nagoya; Hideto Terada, and Kazuo Nagasaka, both of Toyokawa, all of Japan, assignors to Sintokogio, Ltd., Aichi, Japan

Filed July 26, 1974, Ser. No. 492,333

Claims priority, application Japan, Apr. 5, 1974, 49-39298

Int. Cl.² B22C *15/22*

U.S. Cl. 164—160 **8 Claims**



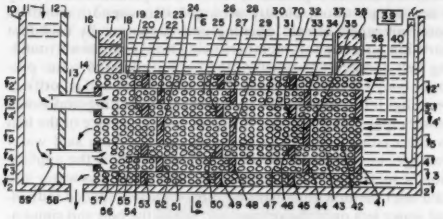
1. A pattern plate device for forming vacuum sealed molds in which a flexible film is sucked to the surfaces of said pattern plate device and placed in tight contact therewith comprising a frame body having a bottom plate and an encircling side wall to form an opening above the bottom plate, a pattern plate adapted to be detachably attached to said frame body, to cover said opening and to define a hollow chamber inside said encircling side wall, said pattern plate being provided with first communicating means along the periphery of said pattern plate for communicating the upper surface of the pattern plate with said hollow chamber and at least one through hole for communicating the upper surface of the pattern plate with said hollow chamber, a pattern provided on the upper surface of said pattern plate, and pressure reducing means disposed in said frame body and adapted to render a reduced pressure to said hollow chamber for producing a sucking action in said first communicating means, so that said flexible film is sucked and placed in tight contact with the upper surface of the pattern plate along the periphery thereof, said pattern including second communicating means, forming spaces between the lower surface of said pattern and the upper surface of said pattern plate, said second communicating means adapted to communicate with at least one of said through holes and to form open ends at positions along the peripheral edge of the lower surface of said pattern, so that said flexible film is adapted to be sucked and placed in tight contact with the peripheral edge of the lower surface of said pattern by said reduced pressure.

3,933,195

LIQUID-LIQUID HEAT EXCHANGER MADE OF PLASTIC SHEETS IMBEDDED IN MASS OF PEBBLES

John C. St. Clair, Box 216, R.R. 5, London, Ohio 43140

Filed Mar. 13, 1972, Ser. No. 234,136
Int. Cl.[2] F28F *3/00, 21/06*
U.S. Cl. 165—1 27 Claims



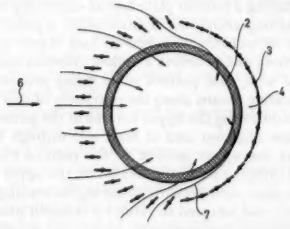
1. A method for indirectly heating a cold liquid with a hot liquid which comprises passing the cold liquid on one side of a sheet of plastic, said cold liquid touching the sheet, passing the hot liquid on the other side of the sheet, said hot liquid touching the sheet at a spot, said spot being on the opposite side of the sheet from the spot where it was mentioned as being touched by the cold liquid, said plastic sheet being imbedded in a mass of pebbles and being held in place by the mass of pebbles, the direction of flow of the cold liquid and the direction of flow of the hot liquid, when taken over the distance of five times the maximum dimension of the heaviest pebble at the spots mentioned, being at an angle to each other, the directions being measured at the spots mentioned.

3,933,196

MOVABLE OPENINGS SHUTTING UP ELEMENTS FOR THE REDUCTION OF WIND ACTIVITY AT COOLING EQUIPMENTS

Laszlo Heller; Laszlo Forgo; Gyorgy Bergmann, and Gyorgy Palfalvi, all of Budapest, Hungary, assignors to Transelektro Magyar Villamossagi, Budapest, Hungary

Filed Aug. 20, 1973, Ser. No. 389,825
Claims priority, application Hungary, Aug. 29, 1972, HE 616
Int. Cl.[2] F28F *13/06, 27/02*
U.S. Cl. 165—1 4 Claims



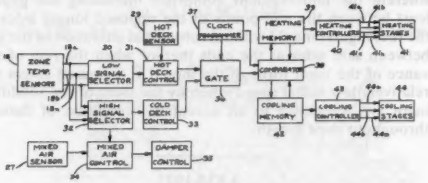
1. A method of heat transfer in cooling equipment including a heat exchanger, a chimney for drawing cooling air through said heat exchanger and selectively movable openings closing elements surrounding said heat exchanger for controlling air flow through said heat exchanger and up said chimney, an improved method comprising selectively setting the positions of said elements in response to existing conditions of wind direction, strength and cooling equipment operating conditions to define a damming area of preselected extent between said heat exchanger and said elements whereby to control said flow of cooling air.

3,933,197

CONTROL OF HEATING AND COOLING AVAILABLE FROM CENTRAL SOURCES TO A MULTI-ZONE TEMPERATURE CONTROLLED SPACE

Darrel E. Zimmer, North Park, and Paul H. Brace, Rockford, both of Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed May 16, 1974, Ser. No. 470,567
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 8 Claims



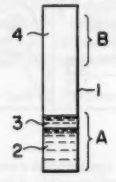
1. A method for automatically controlling the amounts of heating and cooling simultaneously available from a central location to heat and cool a plurality of temperature controlled zones, said method comprising the steps of determining separately the representative heating and cooling demands of said zones, comparing said heating and cooling demands alternately with respective reference values provided by a single means, controlling the amount of heat available as a function of the result of said heating demand comparison, and controlling the amount of cooling available as a function of the result of said cooling demand comparison.

3,933,198

HEAT TRANSFER DEVICE

Toshitsugu Hara; Motokazu Uchida, both of Tokyo; Yasushige Kashiwabara, Musashino, and Michio Yanadori, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 14, 1974, Ser. No. 451,286
Claims priority, application Japan, Mar. 16, 1973, 48-30116; Apr. 25, 1973, 48-46170; May 30, 1973, 48-59770; June 8, 1973, 48-63892
Int. Cl. F28d *15/00*
U.S. Cl. 165—32 11 Claims



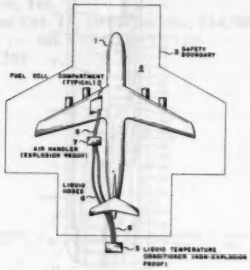
1. In a heat transfer device, the improvements comprising; a vessel having a heating section and a cooling section; a thermal transfer medium for transferring heat from said heating section to said cooling section; and a liquid body having a specific gravity smaller than said thermal transfer medium and being low in vapor pressure at a temperature corresponding to the boiling point of said thermal transfer medium, said liquid being not dissolvable in said thermal transfer medium; said thermal transfer medium and said liquid being charged in said vessel under an adequate pressure which is determined in accordance with an operating temperature of the device and a saturated vapor pressure of said thermal transfer medium, thereby forming two layers therein, a level of said liquid forming an upper layer of said two layers is maintained without being salient into said cooling section.

3,933,199

METHOD AND APPARATUS FOR SUPPLYING A TEMPERATURE CONDITIONED AIRFLOW TO AN OPEN COMPARTMENT IN AN EXPLOSION SUSTAINING AMBIENT SURROUNDING

Roy L. Kilgore, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Division of Ser. No. 223,282, Feb. 3, 1972, Pat. No. 3,848,662.
This application June 21, 1974, Ser. No. 481,485
Int. Cl.² B60H *3/00*
U.S. Cl. 165—42 **5 Claims**



1. Portable apparatus for supplying temperature conditioned, ambient air to the interior of a compartment open to the ambient and containing explosion sustaining vapors at a compartment temperature in the range of from approximate the ambient temperature up to approximately 50°F. above the ambient temperature, said open compartment further producing an explosion sustaining zone ambient to the compartment, said apparatus comprising in combination:

a liquid temperature conditioning means located exteriorly of the explosion sustaining zone;

an explosion proof heat exchange means located remote from the liquid temperature conditioning means and within the explosion sustaining zone, including an air-liquid heat exchange coil;

a liquid supply and return means interconnecting said liquid temperature conditioning means and said heat exchange means and completing a closed, liquid circulating circuit;

means circulating liquid within said circuit whereby temperature conditioned liquid flows from said liquid temperature conditioning means to said heat exchange means for passage through said heat exchange coil and back to said liquid temperature conditioning means;

explosion proof blower means associated with said heat exchange means to supply explosion sustaining zone which is air ambient to said heat exchange means into contact with said heat exchange coil containing temperature conditioned liquid; and

at least one flexible, air flow duct interconnecting said heat exchange means and the compartment interior whereby temperature conditioned ambient air from the explosion sustaining zone is supplied to the compartment.

3,933,200

TEMPERATURE CONDITIONING MEANS

Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 21, 1974, Ser. No. 481,895
Int. Cl.² F28F *1/16, 1/22, 1/26, 1/32*
U.S. Cl. 165—64 **7 Claims**

1. A thermal transfer unit for extruder barrels and other elongated tubular members, comprising:

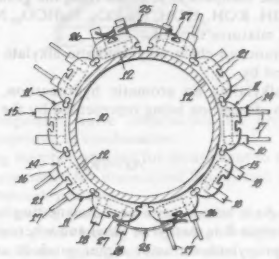
a jacket adapted to be clamped around the barrel, said jacket being formed of more than two elongated metal shoes adapted to be disposed lengthwise of the barrel and in side-to-side relation thereabout,

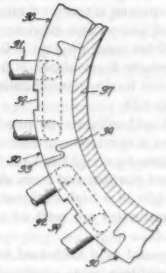
at least certain shoes having temperature conditioning means and each having an inner transverse arcuately-shaped surface which is substantially complementary to the outer transverse surface of a selected barrel and adapted to lie in close contact therewith throughout the major part of the length of a respective shoe,

a longitudinally extending groove in each shoe extending inwardly of the outer transverse surface intermediate the shoe sides, said groove providing for transverse flexing of the shoe,

clamp means between at least one pair of adjacent shoes and having portions respectively seating within the longitudinally extending grooves in the same, said clamp means being constructed to draw together adjoining sides of said pair of shoes,

and means at adjoining sides of adjacent shoes, except said adjoining sides of said pair of shoes, for interconnecting the same in band-forming relation about the barrel, said clamp means providing a tensioning force to draw the arcuate transverse inner surfaces of all shoes against the barrel peripheral surface.





7. A thermal transfer unit for extruder barrels and other elongated tubular members, comprising:

a jacket adapted to be clamped around the barrel, said jacket being formed of more than two elongated metal shoes adapted to be disposed lengthwise of the barrel and in side-by-side relation thereabout,

at least certain shoes having temperature conditioning means and each having an inner transverse arcuately-shaped surface which is substantially complementary to the outer transverse surface of a selected barrel and adapted to lie in close contact therewith throughout the major part of the length of a respective shoe,

each of the sides of each shoe being formed with a longitudinally extending ledge defining a longitudinally extending groove with the respective side of the shoe, the ledge and groove on one shoe side being parallel to but inverted with respect to the ledge and groove on the opposite shoe side, the ledge and groove on one shoe side interlocking with an inverted ledge and groove at the adjoining side of

an adjacent shoe to connect the same.

3,933,201

METHOD USING OVERBASED BRANCHED-CHAIN ALKYLAROMATIC SULFONATES AS WATERFLOOD ADDITIVES

Oliver C. Kerfoot; Charles R. Clark, both of Ponca City, Okla., and Carl D. Kennedy, San Diego, Calif., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 350,552, April 30, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 513,919
Int. Cl.² E21B *43/22*
U.S. Cl. 166—275 **4 Claims**

1. A process for recovering hydrocarbons from a petroliferous formation, said process comprising:

a. injecting into said formation an effective amount of an aqueous mixture containing from about 0.5 to about 25 weight percent of an overbased waterflood additive; and

b. recovering displaced hydrocarbons from said formation, said waterflood additive consisting essentially of:

c. a base component selected from the group consisting of NaOH, KOH, LiOH, Na_2CO_3, $NaHCO_3$, NH_4OH, K_2CO_3 and mixtures thereof;

d. a branched-chain alkylaromatic alkylate sulfonate, prepared by

1. alkylating an aromatic hydrocarbon, said aromatic hydrocarbon being represented by the formula

$$Ar-(R)_n$$

wherein Ar is benzene or a naphthalene ring having a valence of n, wherein R is methyl or ethyl and wherein n is 0, 1, or 2, with a propylene tetramer dimer product containing from about 20 to about 30 carbon atoms per molecule, said aromatic hydrocarbon being employed in an amount equal to from about 1 to about 25 moles of said aromatic hydrocarbon per mole of said propylene tetramer dimer product to produce a branched-chain alkylaromatic alkylate;

2. separating from said alkylate a first portion having a molecular weight from about 200 to about 275 and a second portion having a molecular weight from about 300 to about 475;

3. sulfonating said alkylate to produce a sulfonic acid derived from a mixture containing from about 0.5 to about 2.0 parts by weight of said first portion per part of said second portion and from about 0.2 to about 1.0 parts by weight of a high molecular weight oil-soluble sulfonate precursor per part of said second portion; and,

4. neutralizing said acid with said base component, said waterflood additive being overbased such that the ratio "weight of excess base component/weight of sulfonate" is about 0.03 to about 3.0.

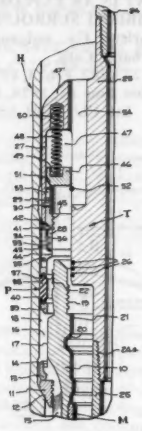
3,933,202

APPARATUS FOR SETTING AND LOCKING PACKING ASSEMBLIES IN WELLHEADS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Oct. 21, 1974, Ser. No. 516,173
Int. Cl.² E21B *23/06, 33/035, 33/128*
U.S. Cl. 166—182 **20 Claims**

11. Apparatus for forming a seal in an annulus between an underwater wellhead housing and a casing hanger installed therein comprising: a running tool having a body connectable to a running pipe string to be lowered thereby into the housing, said body having an actuator portion, packing means actuatable to form a seal between the housing and casing hanger, packing locking means for locking said packing in sealing condition, first shearable means connecting said packing locking means to said actuator portion, second shearable means connecting said packing means to said locking means, said actuator portion being engaged with said packing means to shear said shearable means upon movement of said body



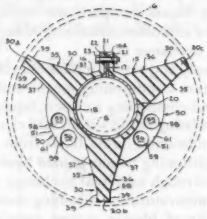
when said locking means initially engages said casing hanger to prevent movement of said locking means with said body.

3,933,203

CENTRALIZER FOR PRODUCTION STRING INCLUDING SUPPORT MEANS FOR CONTROL LINES

Orde R. Evans, P.O. Box 51303, O.C.S., Lafayette, La. 70501

Filed Mar. 27, 1975, Ser. No. 562,590
Int. Cl.² E21B *17/10*
U.S. Cl. 166—241 **5 Claims**



1. An elastomer centralizer for a production string comprising:

a. an elastomer body having a split extending longitudinally thereof;

b. said body having a longitudinally extending, central opening communicating with said split;

c. a plurality of longitudinally spaced rings molded in said body adjacent said longitudinal opening, said rings being split to coincide with the split in said elastomer body and having portions extending substantially at right angles to said rings at said split with an opening therethrough whereby said elastomer body may be closed and positioned on the production string;

d. said elastomer body having a plurality of projections extending longitudinally of said body in circumferentially spaced relationship;

e. an annular rib extending in a plane substantially perpendicular to said elastomer body between predetermined pairs of said projections and having a circumferential outer edge;

f. said rib having a plurality of openings extending therethrough in a plane parallel to the axis of the central opening through said elastomer body; and

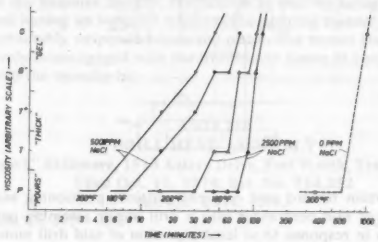
g. said rib having a separate split therein from its circumferential outer edge to each of the respective openings in said rib.

3,933,204

PLUGGING SUBTERRANEAN REGIONS WITH ACRYLIC-EPOXY RESIN-FORMING EMULSIONS

Randolph H. Knapp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 15, 1974, Ser. No. 514,705
Int. Cl.² E21B *33/138*
U.S. Cl. 166—295 **8 Claims**



1. In a well treating process in which a subterranean region is plugged by flowing into it a pumpable fluid that subsequently becomes relatively immobile, the improvement which comprises:

compounding an aqueous emulsion that contains an epoxy-resin-forming polyepoxy polymer, an acrylic-resin-forming polycarboxy polymer, and a material for controlling the rate of the polymerization of said polymers; and

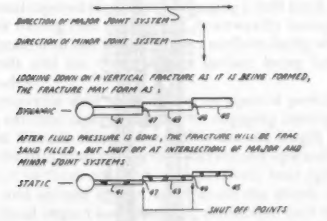
correlating the proportions of said polymers and polymerization rate-controlling material with the temperature and flow properties of the subterranean region to be plugged so that, after being flowed into said region, the emulsion becomes a resinous plug having a significant compressive strength.

3,933,205

HYDRAULIC FRACTURING PROCESS USING REVERSE FLOW

Othar Meade Kiel, c/o Intercomp Resource Development and Engineering, Inc., 2000 W. Loop S., Houston, Tex. 77027

Continuation-in-part of Ser. No. 404,691, Oct. 9, 1973. This application Jan. 27, 1975, Ser. No. 544,411
Int. Cl.² E21B *43/02, 43/26*
U.S. Cl. 166—308 **50 Claims**


DIRECTION OF MAJOR JOINT SYSTEM
DIRECTION OF MINOR JOINT SYSTEM
LOOKING DOWN ON A VERTICAL FRACTURE AS IT IS BEING FORMED, THE FRACTURE MAY FORM AS :
DYNAMIC
AFTER FLUID PRESSURE IS GONE, THE FRACTURE WILL BE FRAC SAND FILLED, BUT SHUT OFF AT INTERSECTIONS OF MAJOR AND MINOR JOINT SYSTEMS.
STATIC
SHUT OFF POINTS

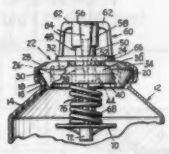
1. A method of well treatment by hydraulic fracturing of the formation to be treated, said fracturing including at least one double cycle comprising injection of fluid into the formation for a period of at least three minutes under pressure throughout said period sufficient to fracture the formation; planned discontinuance of said fluid injection and at least one period of reverse flow of said fluid from said formation for a period of time at least long enough to allow a significant pressure drop in said fluid, resumption of injection, and discontinuance of injection.

3,933,206

HEAT-RESPONSIVE AEROSOL VALVE

James E. Burke, N. Riverside, Ill., assignor to VCA Corporation, Greenwich, Conn.

Filed Aug. 29, 1974, Ser. No. 501,602
Int. Cl.² A62C *35/02*
U.S. Cl. 169—26 **10 Claims**



1. A heat-responsive valve construction for pressurized containers, comprising in combination:

a. a mounting member adapted for securement to the open end of a container for pressurized liquid, said member having a through passage;

b. a resilient sealing gasket secured against the mounting member, said gasket having an opening through it which is aligned with the passage of the member;

c. a rigid washer disposed adjacent the sealing gasket so as to back up the same and having an opening aligned with that of the gasket and mounting member;

d. a valve stem extending through said mounting member, sealing gasket and rigid washer and projecting from both sides of the mounting member, said valve stem having a bore in one end communicating with side orifices disposed intermediate its ends;

e. normally rigid heat-responsive means adjoining the said one end of the valve stem and engaged with the mounting member, said means positioning the side orifices of the stem at that side of the sealing gasket which faces the mounting member and yielding structurally in response to excessive heat; and

f. spring means carried by the valve stem at the other end thereof and engaging the rigid washer for maintaining said heat-responsive means under continual stress and for biasing the valve stem in a direction to shift the side orifices thereof entirely through the sealing gasket.

3,933,207

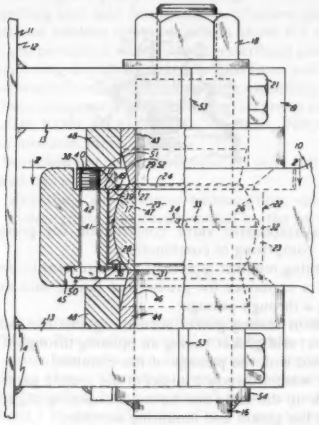
PIVOT BALL ASSEMBLY

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Sept. 30, 1974, Ser. No. 510,293
Int. Cl.² E02F *3/76*
U.S. Cl. 172—804 **1 Claim**

1. A pivot ball assembly for use in swivelly attaching a bulldozer blade to a support arm, comprising a support arm having an opening extending therethrough, an assembled pivot ball unit disposed in said opening and having a spherically-shaped inner race member and a flat-ended outer race member with said members being nested together for swivel movement therebetween and with said inner race member having a central axial opening, a pair of spaced-apart ears affixable to the bulldozer blade and having aligned openings therethrough, a threaded attachment pin disposed in said aligned openings and extending between said ears and through

said inner race opening, said inner race member having opposite end surfaces respectively spaced from said ears, a plurality of spacing members, each spacing member disposed in abutment with one of said inner race end surfaces and the one of said ears nearest thereto, in addition to said spacing members spacer members, each spacer member disposed respectively between each said spacing member and said attachement pin for limiting the clamping force of said attachment pin on said ears and on said assembled pivot or ball unit, said support arm having a first shoulder surface surrounding said opening therein, said outer race member having its axially opposite end surfaces flat and parallel to each other and with one of said opposite end surfaces being disposed in abutment on said first shoulder surface of said support arm for restricting movement of said outer race member on said support arm and in the



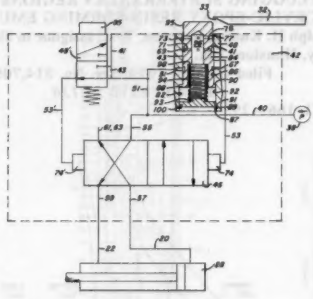
direction from said outer race member toward said one of said opposite end surfaces, said support arm having a second shoulder surface disposed countersunk along the plane of the other of said end surfaces of said outer race member and adjacent thereto, a retainer ring having a planar end surface disposed on and spanning said second shoulder surface and said outer race member other end surface for securing said outer race member on said support arm, said support arm having a plurality of holes extending therethrough in the direction perpendicular to the plane defined by each of said shoulder surfaces and intersecting said second shoulder surface, said retainer ring having a plurality of threaded holes axially aligned with said support arm holes, and screws extending through said holes in said support arm and threaded into said retainer ring holes for releasably holding said retainer ring on said support arm.

3,933,208
CENTRALIZER CONTROL

Edward A. Bailey, Newport; David C. Langevin, Claremont, and James F. Ordway, West Lebanon, all of N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed May 16, 1974, Ser. No. 470,367
Int. Cl.² B23Q 5/00; E21C 9/00
U.S. Cl. 173—1 **10 Claims**

6. A method of controlling a drill string centralizer of a drilling machine which includes an elongated boom, a drill motor assembly longitudinally reciprocable along said boom and a centralizer actuator means mounted on said boom at a location adjacent the path of reciprocable movement of said drill motor assembly and intermediate the axial ends of said boom, comprising the steps of: moving said drill motor assembly along said path in one direction from one end portion of said boom toward the opposite end portion thereof; positioning a portion of said centralizer into a drill string support position in response to at least a portion of said drill motor assembly passing said location on said boom; maintaining said portion of said centralizer in said support position as said drill motor assembly moves past said location in said one direction and until said drill motor assembly passes said location during the return movement thereof; moving said drill motor assembly along said path in an opposite direction from said opposite

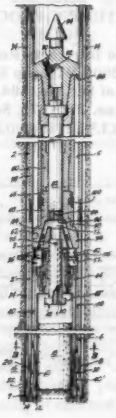


end portion toward said one end portion; positioning said portion of said centralizer into a drill motor assembly pass position in response to at least a portion of said drill motor assembly passing said location during said last mentioned moving; maintaining said centralizer portion in said pass position as said drill motor assembly moves past said location in said opposite direction and until said drill motor assembly passes said location during return.

3,933,209
DRILLING APPARATUS AND TECHNIQUE USING DOWN-HOLE MOTOR

Gerald T. Sweeney, Federal Way, Wash., assignor to Tigre Tierra, Inc., Puyallup, Wash.

Continuation-in-part of Ser. No. 283,208, Aug. 23, 1972, Pat. No. 3,854,539. This application Mar. 1, 1974, Ser. No. 447,360
Int. Cl.² E21B 5/00
U.S. Cl. 173—80 **10 Claims**



1. In a drilling apparatus of the type wherein a piston-like means having a fluid operated hammer mechanism thereon is retractably slidably inserted in the bore of a rotary drill rod

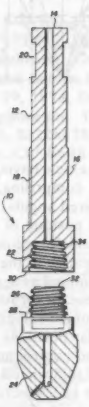
comprising an elongated pipe having a longitudinally extending bore therethrough and a percussive bit at the distal end thereof, and the hammer of the mechanism is operatively applied to an abutment which is relatively transverse the bore adjacent the bit and operatively connected with the bit to receive and transmit the hammer blows into the working face of the bit, and wherein the fluid transmission means for operating the hammer mechanism include means for passing fluid through the piston-like means and means for exhausting the fluid into the region adjacent the working face of the bit after the mechanism has operated, and there are means on the rod whereby the exhausted fluid can discharge from said region toward the proximal end of the pipe on the opposite side of the pipe from the piston-like means, and means on the piston-like means for generating a pressure differential thereacross longitudinally of the bore to maintain the hammer mechanism in operative relationship to the abutment during the application of the hammer thereto, the feature of said bit being annular and having an inner bit adjacent the opening thereof which is retractably suspended from the piston-like means and operatively interengaged with the drill rod to rotate in conjunction with the annular bit.

3,933,210

DRILL HEAD ASSEMBLY

Sam C. Skidmore, 1513 Azteca Drive, Fort Worth, Tex. 76112

Filed Oct. 11, 1974, Ser. No. 514,252
Int. Cl.² E21C *15/02*
U.S. Cl. 173—132 **5 Claims**



1. A drilling tool assembly, comprising:

a. a shank having an upper end for receiving driving forces which are intended to drive the assembly into the earth, and having a counterbore opening at its lower end with internal tapered threads for engaging a drill head, and the shank having first and second downwardly facing impact surfaces, with one of said impact surfaces being above the threads and the other impact surface being below the threads;

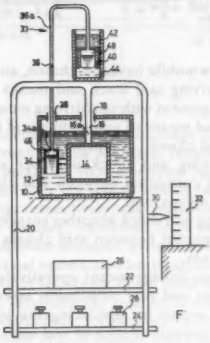
b. a removable drill head having an upward protuberance with external tapered threads for engaging corresponding shank threads along substantially the full length thereof, and the drill head having first and second upwardly facing impact surfaces adapted to respectively bear against the first and second impact surfaces on the shank, and the drill head impact surfaces being positioned such that they are still separated from the confronting shank impact surfaces by substantially identical gaps when the threads of the two elements initially make up along the pitch line, and the flanks of the threads having a certain surface finish measured in microinch units, and the ratio of surface finish (as measured in microinches) to the initial gap between confronting impact surfaces (as measured in thousandths of an inch) is between about 3.0 and 8.0, and said initial gaps between the impact surfaces being within the range of about 0.010–0.070 inch, such that the threads will be slightly deformed as torque is applied to the drill head in order to bring both sets of confronting impact surfaces into load-bearing contact with one another.

3,933,211

BUOYANCY BALANCE

Peter Schmid, Vienna, Austria, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 15, 1974, Ser. No. 497,618
Claims priority, application Austria, Sept. 4, 1973, 47654/73; Sept. 28, 1973, 48345/73
Int. Cl.² G01G *5/02*
U.S. Cl. 177—207 **10 Claims**



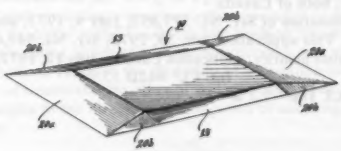
1. A buoyancy balance comprising a buoyant body floating in a fluid, a container for containing the fluid, a load scale, means for coupling the load scale with the buoyant body, and means for partially compensating the change in buoyancy brought about by the movement of the load scale.

3,933,212

WEIGHING APPARATUS

Chester D. Bradley, Darien, and Malcolm C. Tate, Stamford, both of Conn., assignors to The A. H. Emery Company, New Canaan, Conn.

Filed Nov. 11, 1974, Ser. No. 522,413
Int. Cl.² G01G *5/04*
U.S. Cl. 177—209 **8 Claims**



1. Weighing apparatus comprising

A. a platform structure having a planar upper surface;

B. a frame structure wholly underlying the surface plane of the platform structure; and

C. a plurality of mutually displaced hydraulic load cells interposed between downwardly directed surface areas of the platform structure and upwardly directed areas of the frame structure for conjointly measuring, by their compression between the two structures, the total weight of

a load placed on the upper platform surface, each of said load cells

i. being free from attachment to the frame structure; and

ii. having a positive attachment to the platform structure.

3,933,213

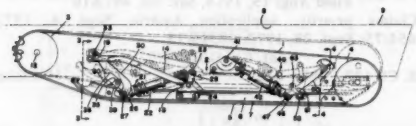
VARIABLE RESPONSE SNOWMOBILE SUSPENSION SYSTEM

Darrell L. Trowbridge, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 11, 1974, Ser. No. 460,024

Int. Cl.² B62D *55/08*

U.S. Cl. 180—5 R **17 Claims**



1. In a snowmobile having a chassis, an endless drive track, means for driving said track and means for supporting said track in engagement with said driving means and the ground,

an improved means of suspending said track support means from said chassis, comprising:

a front spring and shock absorber suspension assembly pivotally connected between said chassis and said track support means, and

a rear spring and shock absorber suspension assembly pivotally connected between said chassis and said track support means,

and separate linkage means operatively connecting each of said front and rear suspension assemblies to said track support means for displacing the spring and shock absorber elements of each of said assemblies in unison over the operating range thereof in response to displacement of said track support means with respect to said chassis,

each of said separate linkage means including a lever arm and means associated with each of said lever arms for independently varying the mechanical advantage of each of said assemblies over its operating range in response to displacement of said track support means, and

wherein one of said lever arms comprises a cam surface and said means for varying the mechanical advantage includes a low friction means attached to said track support means and bearing upon said cam surface.

3,933,214

ALL TERRAIN PLEASURE VEHICLE

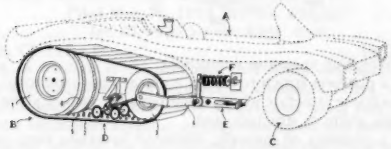
Georges E. Guibord, 462 Edwards St., Rockland, Ontario, and Marcel P. Guibord, 72 - 6th Ave., Apt., 6, Ile Perrot, Quebec, both of Canada

Continuation of Ser. No. 377,852, July 9, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,663

Claims priority, application Canada, July 12, 1972, 146933

Int. Cl.² B62D *55/00*

U.S. Cl. 180—9.2 R **5 Claims**



1. A half track attachment for a vehicle, said attachment comprising a pair of driving wheels, a pair of flexible endless tracks, a pair of auxiliary wheels spaced a distance from said driving wheels for engageably guiding said tracks, a plurality of spaced longitudinally aligned protrusions directed inwardly from the inside surface of each of said tracks, and a plurality of circumferentially aligned and radially inwardly directed protrusion receiving holes in each of said driving wheels, the holes in each driving wheel being positioned so that each hole overlaps the next to form a circumferential groove having generally corrugated protrusion engaging sides, whereby the holes in said driving wheels may coact with the protrusions on said tracks such that each driving wheel may engage and propel its own track.

3,933,215

DIGITAL SYSTEM FOR CONTROLLING THE WHEELS OF A HEAVY-DUTY COMMERCIAL VEHICLE

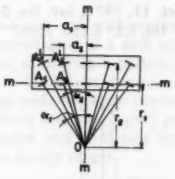
Willy Scheuerle, Pfedelbach-Öhringen, Germany, assignor to Willy Scheuerle.Fahrzeugfabrik, Pfedelbach-Ohringen, Germany

Filed Aug. 15, 1974, Ser. No. 497,731

Claims priority, application Germany, Aug. 16, 1973, 2341442

Int. Cl.² B62D *61/10*

U.S. Cl. 180—23 **19 Claims**



1. Steering system for a vehicle having a plurality of individually controllable wheels, comprising, in combination, first means for furnishing a desired angular position signal indicative of the desired angular position of said wheels relative to a determined axis of said vehicle; second means for furnishing actual position signals indicative of the actual position of said wheel relative to said determined axis, at least said first or said second means comprising means for furnishing a digital signal having a plurality of determined values each corresponding to one of a plurality of angular positions of said wheels relative to said determined axis; and control means connected to said first and second means and said wheels for adjusting the angular position of said wheels as a function of said desired and actual position signals, in such a manner that said angular position of said wheels varies as a predetermined non-linear function of said desired position signal.

3,933,216

VEHICLE WITH ALIGNED INTAKE AND EXHAUST PIPES

Gordon A. Irwin, Harwood, N. Dak., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Feb. 20, 1975, Ser. No. 551,305

Int. Cl.² B60K *13/02, 13/04*

U.S. Cl. 180—54 R **6 Claims**

1. A self-propelled vehicle having an internal combustion engine for propelling the vehicle and an enclosed operator's cab,

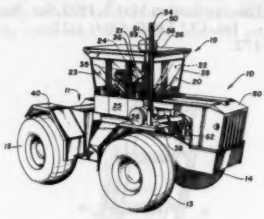
said internal combustion engine being disposed forwardly of said cab and having an intake manifold and an exhaust manifold,

said operator's cab comprising a seat for the operator, controls for controlling the operation of the engine and the steering of the vehicle, and an enclosure for the cab including a windshield, side windows and upright front

corner posts disposed between said windshield and said side windows,

a vertical intake pipe connected to said intake manifold and extending above the top of said cab,

a vertical exhaust stack connected to said exhaust manifold and extending above the top of the cab, and



means mounting said intake pipe and said exhaust stack on said vehicle to one side of and in front of one of said corner posts and closely adjacent thereto with the longitudinal axes of said intake pipe and exhaust stack lying in a substantially vertical plane extending diagonally with respect to said windshield and through said corner post so that said intake pipe and said exhaust stack are both disposed closely adjacent to said engine but offer the minimum of obstruction to the view of the operator.

3,933,217

DRIVE GEAR SYSTEM FOR MOTOR VEHICLES

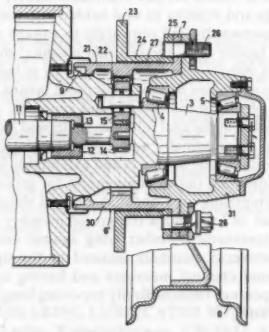
Johann Eichinger, Putzbrunn, Germany, assignor to Carl Hurth, Maschinen- und Zahnradfabrik, Munich, Germany

Filed Mar. 29, 1974, Ser. No. 456,255

Claims priority, application Germany, Apr. 4, 1973, 2316932; May 4, 1973, 23226075

Int. Cl.² B60K *17/04*

U.S. Cl. 180—70 R **8 Claims**



1. A drive train for a vehicle having a frame member and a hub, said drive train comprising: drive motor means fixed to said frame member, and having a rotatable output shaft; planetary gear means drivingly connecting said output shaft to said hub, said planetary gear means comprising a sun gear secured to said output shaft, a planet gear secured to said frame member about a fixed rotation axis and in meshing engagement with said sun gear, and a first elongated hollow sleeve having an internal toothed ring gear in meshing engagement with said planet gear, and having first flange means for securement to said hub; a second elongated hollow sleeve in radially spaced relationship to said first sleeve forming a radial air space therebetween, said second sleeve having a disk brake means, and having second flange means for securement to said hub; said hub having third flange means, said first, second and third flange means being relatively coextensive and parallel; and fastener means for securing said first, second and third flange means together.

3,933,218

CONTAINER HANDLING TRUCK

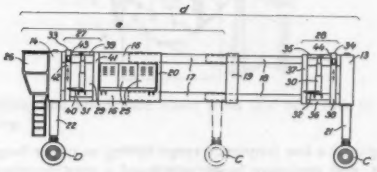
Ernst Bertil Oler, and Odd Peder Hunnes, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Oct. 7, 1974, Ser. No. 512,565

Claims priority, application Sweden, Oct. 11, 1973, 7313797

Int. Cl.² B60P *1/64*; **B62D** *5/04*, *33/08*

U.S. Cl. 180—79.1 **8 Claims**



1. A truck for stowing, stacking etc., large containers of varying sizes, said truck having a chassis supported at four corners thereof by means of four elongated legs extending downwardly from said four corners to wheels carried by the lower ends of said legs respectively, said chassis comprising a pair of substantially parallel, transverse cross beams spaced from one another and interconnected to one another by a pair of elongated longitudinal beams, said longitudinal beams each comprising a plurality of telescopic beam parts which can be selectively displaced longitudinally relative to one another to vary the effective length of said longitudinal beams thereby to vary the effective length of said chassis, said chassis defining a pair of open end portals at the opposing ends of said chassis respectively, each of said end portals being formed by one of said cross beams and by two of said downwardly extending legs respectively, the width of each end portal corresponding to the distance between said two legs and the height of each end portal being greater than the distance between said legs, said pair of longitudinal beams being disposed in vertically superposed relation to one another with both longitudinal beams being located adjacent the same corresponding ends of said cross beams whereby a horizontal section of said chassis is shaped substantially in the form of a right-angled yoke having a substantially C-configuration, the lower of said pair of longitudinal beams being disposed at an elevated position and cooperating with said legs and with the chassis to form a side portal having a width corresponding substantially to the length of said chassis and a height substantially equal to the distance between the pair of legs at a given end of said chassis, and said truck including a steering system operative to set the wheels at the lower ends of said legs into position for steering said vehicle along either of two main directions, one of said main directions being in the direction of elongation of said longitudinal beams and the other of said main directions being at right angles to the direction of elongation of said longitudinal beams.

3,933,219

SPEAKER SYSTEM

John L. Butler, Marshfield, Mass., assignor to Ambient, Inc., N. Marshfield, Mass.

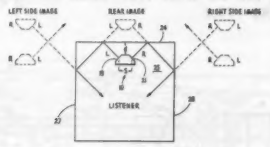
Filed Apr. 8, 1974, Ser. No. 458,843

Int. Cl.² H05K *5/00*

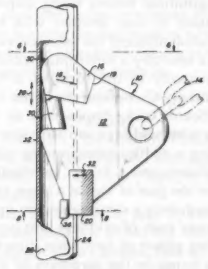
U.S. Cl. 181—144 **9 Claims**

1. A speaker system for use in a listening room having means defining a plurality of reflective surfaces including an

end wall, said system comprising a unitary dual channel speaker enclosure having a plurality of enclosing walls including a pair of walls disposed at an angle, other than a straight angle, to each other and also at an acute angle to the end wall of the room, and a pair of speaker arrays each including a low audio frequency speaker and an upper audio frequency speaker, each array carried, respectively, by each wall of the pair of walls and the speakers of each array being operated from different stereo channels to provide left and right channel signals to respective arrays thereby providing stereo effect in a unitary enclosure, each said low frequency speaker operating over a low frequency range having an upper frequency limit, said enclosure being positioned a predetermined distanced from the end wall to permit mutual coupling between the low audio frequency speakers wherein the distance *d* is less than or equal to λ/4 wherein λ is the wavelength of sound corresponding to the upper frequency limit of the low frequency speakers, said low frequency speakers being disposed apart a distance *s* to provide mutual radiation resistance at bass frequencies, and radiating toward the end wall, wherein the distance *s* is less than or equal to λ/2 where λ is the wavelength of sound corresponding to the upper frequency limit of the low frequency speakers.



3,933,220
CLIMBING DEVICE
William E. Swager, P.O. Box 498, Fremont, Ind. 46737
Filed May 17, 1974, Ser. No. 471,061
Int. Cl.² A62B *35/00*
U.S. Cl. 182—3 **19 Claims**



1. A safety device comprising the combination of a clamping means and an elongated firm support rail, an elongated slot disposed in the outer surface of said support rail, said slot having substantially parallel facing walls on each side, said clamping means having a clamping portion mounted alternately to slide freely in said slot in sliding engagement with said side walls and including means for gripping and binding said clamping means firmly to said facing walls of said slot to prevent movement in the position of clamped engagement with said support rail, and a trigger arm supporting said clamping means extending laterally from said clamping means for moving said clamping means in easy pull sliding in said slot, and for activating said clamping means into clamped engagement with the facing walls of said slot by rapid downward pull by the user.

3,933,221
LADDER ADJUSTING AND STABILIZING APPARATUS
Virgil H. Sorenson, P.O. Box 198, Staffordville, Conn. 06077
Continuation-in-part of Ser. No. 209,073, Dec. 17, 1971, abandoned. This application May 3, 1973, Ser. No. 357,070
Int. Cl.² E06C *1/04, 1/22*
U.S. Cl. 182—172 **10 Claims**

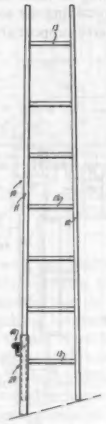
1. Stabilizing means for a ladder having side rails with interconnecting rungs and including at least two spaced tubular rungs comprising a first elongated rod extending through one of said rungs, a second elongated rod extending through the other of said rungs, a pair of stabilizers positioned on each side of said ladder, and means on said stabilizers fixedly securing them to said rods and relative to said ladder with the stabilizers extending downwardly and outwardly to engage a surface upon which the ladder rests, the last said means comprising a pair of elongated stabilizer supports secured by at least one of said rods to opposite sides of said ladder and means securing the upper ends of said stabilizers to said supports, said supports being disposed in parallel relationship to said ladder rails and at least one longitudinally adjustable element is removably carried by one of said supports and extendable below the bottom of the adjoining rail to compensate for ground slope, each support comprising an elongated channel shaped member having a pair of legs and a transverse member coupling said legs, said transverse member lying against one of said ladder rails, transverse members secured to the upper and lower ends of said channel members and having upper and lower aligned openings for removably receiving longitudinally adjustable elements.

3,933,222
LADDER LEVELER
Coba C. Craig, Jr., Lexington, Ky., assignor to James E. Jenkins; Joseph L. Moore and Coba C. Craig, all of Lexington, Ky., part interest to each
Filed Sept. 25, 1974, Ser. No. 509,304
Int. Cl.² E06C *7/44*
U.S. Cl. 182—204 **2 Claims**

1. A ladder leveler comprising,
a ladder having a pair of parallel legs spaced apart by rungs which interconnect them, each of the said legs being channel shaped with spaced flanges projecting parallel to the rungs,

at least one leg of the ladder having an adjustable extension mounted to it for extending the effective length of said leg to enable said ladder to rest stably on uneven ground,

said extension being in the form of a channel having a back wall and spaced side walls extending from the back wall, said side walls projecting parallel to the said flanges of said one leg, said extension also including inturned retainer lips extending from the side walls and projecting reversely toward said back wall, the said one leg being slidably embraced within the channel and the respective



flanges thereof retained between said retainer lips and the adjacent side walls, said extension permitting only longitudinally sliding movement of the leg with respect to it,

and a lock for locking the longitudinal position of the extension of the leg, said lock being mounted to one of the extension and the leg, the other of the extension and the leg having a series of longitudinally spaced holes,

said lock including a finger projecting through said one of said extension and leg and selectively engageable in the respective holes of said series to prevent movement of the extension on the leg.

3,933,223

BEARING LUBRICATED WITH WATER

Ludwig Ludin, Kesselackerweg, CH-5611 Anglikon-Wohlen, Switzerland, and Nikolaus Laing, Hofener Weg 35-37, D-7141 Aldingen bei Stuttgart, Germany

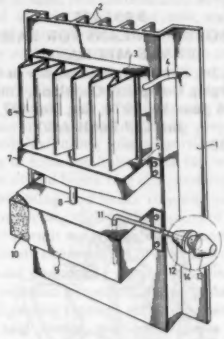
Filed Nov. 26, 1973, Ser. No. 419,215

Claims priority, application Austria, Nov. 28, 1972, 10107/72

Int. Cl.² F01M *1/06*

U.S. Cl. 184—7 R **5 Claims**

1. Bearing in combination with a rotating machine in which the cooperative sliding elements of the bearing moveable relative to each other are lubricated by water and wherein the rotating machine is surrounded in part by ambient air containing moisture, the improvement comprising having a heat sink in thermal contact with said ambient air and, means whereby the heat sink may absorb heat from the air and cool it below its dew point to condense water therefrom, and means extending from said heat sink to said bearing for collecting and



conveying the condensed water from said heat sink to said bearing.

3,933,224

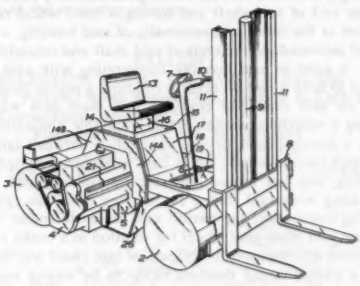
FORK LIFT TRUCK

Jan Ove Lennart Nilsson, Billesholm, and Carl Nils Erik Risberg, Eslov, both of Sweden, assignors to Stockamollan AB, Eslov, Sweden

Filed May 30, 1973, Ser. No. 365,307

Int. Cl.² B60K *5/04, 5/10, 26/00;* **B66B** *9/20*

U.S. Cl. 187—9 R **4 Claims**



1. A fork lift truck of the type including a chassis mounted for movement over a surface by front and rear pairs of wheels, power means for driving the truck, transmission means, a hydraulic fork lift at one end of the chassis, a driver's seat, and steering and control means for controlling operation of the truck, the improvement wherein a portion only of said chassis extending between said front and rear wheels is in the form of an arch including an upper portion which is located between and substantially above the level of said pairs of wheels and steeply sloping front and rear portions, said arch-shaped portion lying essentially on one side of the vertical longitudinal median plane of the truck, the portion of the chassis on the other side of said longitudinal median plane lying substantially on a level with the chassis ends at the pairs of wheels, means mounting said power means underneath said upper portion of said chassis arch and between said pairs of wheels, said driver's seat including a chair-like portion mounted for pivotal movement about a generally vertical axis above said upper portion of said arch, a foot-rest portion spaced substantially below said upper portion of said arch and means joining said foot-rest portion and said chair-like portion and extending in outwardly spaced relation to said steeply sloping portiions of said arch, and said steering and control means being mounted

on said driver's seat for pivotal movement therewith about said vertical axis.

3,933,225

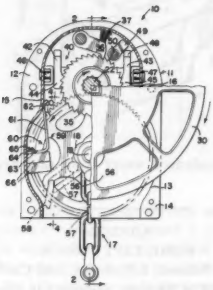
SHOCK ABSORBING MEANS FOR RAILWAY HAND BRAKE MECHANISM

Frank E. Bretz, Jr., Elmhurst, Ill., assignor to Cleveland Hardware and Forging Company, Cleveland, Ohio

Filed June 10, 1974, Ser. No. 477,898

Int. Cl.² B61H *1/00*

U.S. Cl. 188—33 **9 Claims**



1. In a hand brake mechanism, the combination with a housing, a chain winding drum and a main gear wheel rotatably mounted on said housing, a hand wheel shaft rotatably bearingly mounted on said housing substantially centrally and at one end of said shaft and having a hand wheel receiving section at the other end externally of said housing, a ratchet wheel intermediate the ends of said shaft and rotatable therewith, a pawl in said housing cooperating with said ratchet wheel to hold it against reverse rotation, a pinion freely rotatable on said shaft and engaging said main gear wheel and having a radially extending flange rotatable conjointly therewith, a disengageable driving connection between said flange and said ratchet wheel, a trip cam rotatably mounted in said housing, trip bar means operable by said trip cam for cooperating with said flange for moving it to disengage said driving connection and permit said pinion to rotate freely to release said main gear wheel for rotation in a brake releasing direction accompanied by release of said chain winding drum and a chain wound thereon likely to be swung against an overlying side wall of said housing and to wind in the wrong direction on said drum of: energy absorbing means for stopping rotation of said drum and chain connected thereto comprising a bracket stationarily mounted in said housing, and resilient means carried by said bracket and located in the path of at least a portion of said chain or drum for absorbing some of its kinetic energy incident to release thereof under tension.

3,933,226

DISC BRAKE MOUNTING STRUCTURE

Jean Maurice, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

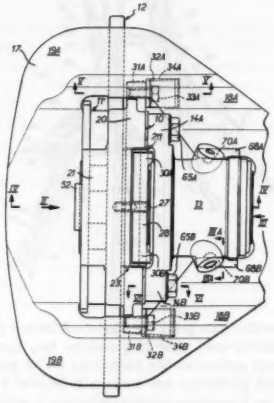
Continuation of Ser. No. 53,346, July 9, 1970, abandoned. This application Apr. 15, 1974, Ser. No. 461,127

Claims priority, application France, July 11, 1969, 69.23672; Aug. 7, 1969, 69.27122; Mar. 27, 1970, 70.11110

Int. Cl.² F16D *55/228*

U.S. Cl. 188—72.5 **11 Claims**

1. A disc-brake comprising a generally right-angle dihedral-shaped fixed support, a rotatable disc fixed to a member to be braked, a pad mounted for movement perpendicular to the plane of the disc on each side thereof, a control unit and a ring-like transfer member mounted for movement perpendicular to the disc, said control unit including a cylinder and two pistons mounted for sliding movement in opposite directions in said cylinder, one of said pistons acting directly on a first pad and the other of said pistons acting indirectly on the second pad through the intermediary of said transfer member, said ring-like transfer member extending around said fixed support, the control unit, the pads and a portion of said disc, said generally right-angle dihedral-shaped fixed support comprising a plate member parallel to the disc and a positioning member perpendicular to the disc radially outward of and having its radially inner surface facing the edge of the disc, said plate member and said positioning member being fixed relative to each other, said plate member having a surface facing the control unit and including a frame portion for limiting the movement of the first pad in both directions of rotation of the disc and in at least one radial direction, said positioning member including at least one longitudinal support abutment for radially retaining the second pad relative to the disc, at least two transverse support abutments for limiting



the movement of the second pad in both directions of rotation of said disc, and transverse support abutments being disposed at the ends of said positioning member, two lateral extensions on said second pad and being disposed on opposite sides of said positioning member for contacting said transverse support abutments, said transfer member having a radially outwardly directed supporting surface that faces the positioning member, said second pad having two opposed support surfaces one of which contacts said transfer member supporting surface and the other of which contacts said longitudinal support abutments on said positioning member, said surfaces and abutments extending transversely of the plane of said disc and said support surfaces extending transversely of a radius of said disc that passes through said support surfaces, and resilient means between said transfer member and said fixed support urging said transfer member radially outwardly, the positioning member and the transfer member resiliently gripping the second pad radially between themselves.

3,933,227

BRAKE HAVING A BRAKING MEMBER IN THE FORM OF A RING, ESPECIALLY FOR AUTOMOBILE VEHICLES

Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 2, 1974, Ser. No. 494,298

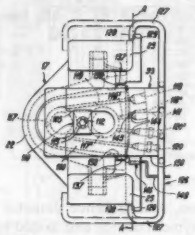
Claims priority, application France, Aug. 17, 1973, 73.30012

Int. Cl.² F16D *53/00*

U.S. Cl. 188—76 **31 Claims**

1. A spot type ring brake comprising a fixed support, a member to be braked having a normally generally cylindrical ring, one brake pad arranged for frictional engagement with

the radially inner face of said ring and another brake pad arranged for frictional engagement with the radially outer face of said ring, a stirrup member straddling the brake pads and having legs extending respectively inside and outside said ring and a bight portion interconnecting said legs and opposite the free outer edge of said ring, operating means housed in said stirrup member and acting directly on one of said brake pads, a retaining member mounting the stirrup member for sliding movement for indirectly transmitting force to said other brake pad as well as for pivotal movement of only one fixed radius about only one fixed axis for compensating for eventual conical deformation of said ring so that said stirrup member substantially stays with said ring even when the latter becomes



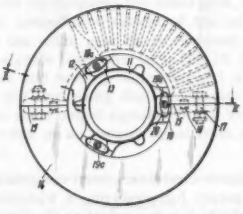
conically deformed with use, said retaining member having a central portion closely overlying the surface of the bight portion of said stirrup remote from the free outer edge of said ring and in simple supporting contact therewith, said retaining member having two lateral branches securing it to said fixed support, said retaining member having a fulcrum thereon that positions said stirrup for said pivotal movement of fixed radius about said fixed axis that is perpendicular to the axis of the ring and substantially tangential to the cylinder of the ring, the ends of said fulcrum being spaced apart a substantial distance along said fixed axis, and resilient means axially urging said stirrup member away from said ring and urging said bight portion of the stirrup member against the central portion of said retaining member overlying the same.

3,933,228

BRAKE DISK CONSTRUCTION

Alfred Otto, and Hans Zeuner, both of Remscheid, Germany, assignors to Bergische Stahl-Industrie, Stuttgart, Germany

Filed Feb. 7, 1974, Ser. No. 440,467
Int. Cl.² F16D *65/12*
U.S. Cl. 188—218 X L **7 Claims**



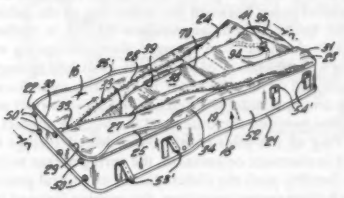
3. A brake disk construction, comprising, in combination, a circular hub unit adapted to be connected to a vehicle wheel for rotation therewith and comprised of a plurality of radially outwardly extending angularly spaced carrier arms each comprised of a pair of angularly spaced prong portions defining between themselves a receiving recess; a circular brake ring unit surrounding said hub unit and comprised of angularly spaced radially inwardly projecting mounting projections each clamped between the two prong portions of a respective carrier arm, said brake ring unit being divided along at least one radial plane into at least two parts located at opposite sides of the axis of said circular brake ring unit, each part having surfaces abutting corresponding surfaces of the adjoining part to form radially extending seams located in said at least one radial plane, wherein at least one of said mounting projections constitutes the radially innermost part of a radially extending joining portion forming part of said circular brake ring unit, and wherein said at least one mounting projection and the associated radially extending joining portion are bisected by said radial plane to form two halves each fast with a respective one of said parts of said brake ring unit; and connecting means dismountably mounting said brake ring unit on said hub unit by releasably connecting together said parts of said brake ring unit, whereby to permit separation of said parts of said brake ring unit to facilitate dismounting of said brake ring unit from said hub unit, said connecting means including an elongated connector unit oriented perpendicular to said axis and to said radial plane and passing through and connecting together said two halves of said joining portion, wherein said receiving recesses and said mounting projections extend in direction axially of said hub unit and of said brake ring unit, wherein said connecting means further includes wedge members wedged into the ends of said axially extending receiving recesses to prevent relative axial shifting between said hub unit and said circular brake ring unit, wherein said axially elongated mounting projections are shorter in axial direction than said axially extending receiving recesses, and wherein each axially extending receiving recess has at each of its axial ends a widened portion in which is received and wedged one of said wedge members, and wherein said connecting means further includes a plurality of screws each passing through and connecting together the two wedge members located in a respective one of the receiving recesses.

3,933,229

MULTI-FUNCTIONAL FOLDABLE SUITCASE

Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,644
Int. Cl.² A45C *3/00*
U.S. Cl. 190—41 B **15 Claims**



1. A multi-functional, foldable suitcase comprising first and second flexible, elongated side walls, said first side wall overlying said second side wall in spaced relationship relative thereto, a continuous flexible end wall of substantially constant cross-section having a pair of opposed edges, each opposed edge being connected to a respective side wall for thereby defining a suitcase enclosure for housing garments therein, said suitcase enclosure having a pair of remote ends therein, means within said remote ends of said enclosure for defining a pair of concomitant, discrete packing compartments within said enclosure for housing folded garments therein, each of said packing compartments having a depth corresponding to said means, said means comprising first and second substantially resilient configured frames of predetermined length fitted and secured within a respective remote end of said enclosure between said first and second side walls, means underlying said first side wall and cooperating therewith for defining a garment suspension space within said en-

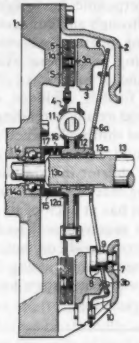
closure said last-mentioned means overlying said packing compartments, said suspension space having dimensions of width and length substantially corresponding to said first side wall, and means secured to said second side wall for defining fold lines therein, said remote ends of said suspension space being foldable into confronting relation about said fold lines.

3,933,230

CLUTCH WITH DISC RELEASE SPRING

Kazuma Adachi, Yao, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 300,366, Oct. 24, 1972, Pat. No. 3,834,501. This application June 3, 1974, Ser. No. 475,873
Claims priority, application Japan, Nov. 17, 1971, 46-107639
Int. Cl.² F16D *13/75*
U.S. Cl. 192—70.28 **2 Claims**



1. A device for preventing improper disengagement of a clutch comprising a combination of: a clutch disc having clutch facings disposed between a flywheel and a pressure plate, a main drive shaft fitted in a spline hub of the clutch disc through spline engagement to support the clutch disc in an axially movable manner, a pilot bearing for rotatably supporting an end of the main drive shaft on the flywheel, and spring means interposed between the inner ring of the pilot bearing and the spline hub to accumulate therein a resilient force when the clutch is in an engaged state, the spring means including a combination of a plurality of dished springs housed and retained in a cylindrical holder, the cylindrical holder having one end slidably fitted around a cylindrical portion of the spline hub and the other end in abutting contact with the inner ring of the pilot bearing, the dished springs being arranged in alternate orientation, the spring means being operable to forcibly push the clutch disc to its neutral position upon a clutch disengaging operation, the pushing force of the spring means being so determined as to be reduced to zero when the clutch disc reaches the neutral position.

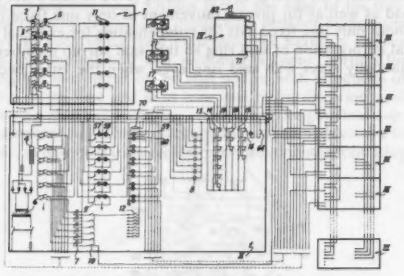
3,933,231

AUTOMATIC WORKSHOP INSTALLATION

Herbert Paul Vinet, 12, rue Paul Redoute, Meudon-la-Foret, France (92360)

Filed Aug. 12, 1974, Ser. No. 497,146
Claims priority, application France, Oct. 5, 1973, 73.35617
Int. Cl.² G07F *17/00*
U.S. Cl. 194—1 R **13 Claims**

1. A workshop installation in which a user can service equipment, said installation comprising at least one enclosure having a single access space and a displaceable barrier at said access space, said barrier being normally retracted to allow free entry into said enclosure via said access space and being closable after entry into said enclosure, means in said enclosure for removable support of tools to be utilized by the user within the enclosure, a pre-payment device in the enclosure coupled to the barrier and the tool support means for allowing removal of tools after sufficient payment has been made in the pre-payment device corresponding to a pre-determined period of time, at least one electrical warning circuit, means for locking said barrier in the closed position thereof, and presence detector means for detecting the presence of the tools in



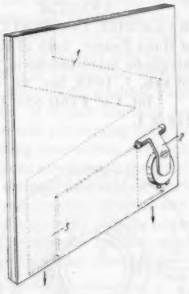
the tool support means, said presence detector means being coupled to said pre-payment device and to said barrier locking means and electrical warning circuit for activating the barrier locking means when a tool is removed from the tool support and for closing the electrical warning circuit when the pre-determined period of time of the pre-payment device has expired and the tools have not been returned to the tool support means.

3,933,232

COIN VALIDATOR

Brian Christopher Searle, Staines, England, and Glenn Richard Ritter, West Allenhurst, N.J., assignors to Tiltman Langley Ltd., England

Filed June 17, 1974, Ser. No. 480,256
Int. Cl.² G07F *3/02*
U.S. Cl. 194—100 A **16 Claims**



1. A coin validator electronic circuit comprising:
coin sensing means for producing a transient signal the amplitude of which is dependent on the denomination of the coin sensed;
a plurality of comparator means set up with amplitude parameters respectively to represent the coin denomination to be validated and each operable by a signal whose amplitude is at least equal to the amplitude parameter of the comparator means, but so that operation of more than one comparator means by any one signal is sequential;
means for generating a control signal at the maximum of the transient signal amplitude;

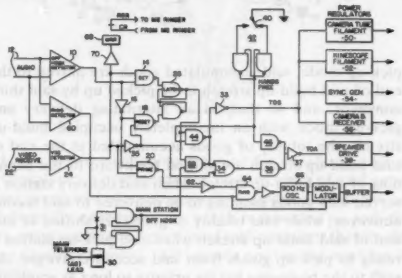
and means responsive to a control signal generated by said generating means and to the operation of a comparator means, only when the coin sensed by the coin sensing means gives rise to said control signal and to said operation of the comparator means coincidently in time, to produce a circuit output signal indicating validation of that coin.

3,933,233

CONTROL CIRCUIT FOR SUBSCRIBER STATION IN VIDEO TELEPHONE SYSTEM

Uno Randmere, Victor, and Walter A. Halbig, Webster, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,936
Int. Cl.² H04M 11/06
U.S. Cl. 179—2 TV **5 Claims**



1. A control circuit for a subscriber station in a video telephone system of the kind in which the station includes separate audio and video receive leads, a loudspeaker and means for driving it, an annunciator system for alerting the subscriber to incoming video calls, and video gear including a video camera, a video display device, and means for producing synchronizing signals, said circuit comprising:

a. an OFF HOOK detector for producing an output signal in response to an off-hook signal on the audio leads of the station,

b. a RING detector for producing an output signal in response to a ring signal on the audio leads,

c. a VIDEO detector for producing an output signal in response to a video supervisory signal on the video receive leads of the station, and

d. means including electrical toggles, gates, and invertors responsive to the output signals produced by said OFF HOOK, RING, and VIDEO detectors for selectively energizing and deenergizing the video gear, the loudspeaker, and the annunciator system of the subscriber station, turning the video gear on in response to simultaneous output signals from the OFF HOOK and the VIDEO detectors and holding it deenergized in the absence of either, and energizing the loudspeaker drive means in response to an output signal from the VIDEO detector in the absence of an output signal from the OFF HOOK detector.

3,933,234

DOCUMENT HANDLING ASSEMBLY FOR A PRINTER

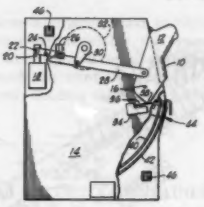
Jack L. Smith, Oklahoma City; Darby A. Gray, Norman, and Brian R. Sullivan, Oklahoma City, all of Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Feb. 4, 1972, Ser. No. 223,589
Int. Cl.² B41J 13/00
U.S. Cl. 197—127 R **4 Claims**

1. For use in a document printer having a printing mechanism, a document handling assembly for positioning a document relative to the printing mechanism comprising:

a. document guiding means for constraining movement of the document to a predetermined path relative to the printing mechanism;

b. document engaging means including movable fingers for gripping the lower edge of a document at one or more



places to hold the document during movement along a generally vertical predetermined path; and

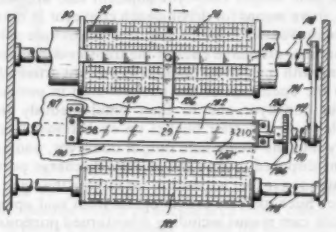
c. controllable driving means connected to said document engaging means for driving said engaging means between print positions along the predetermined path.

3,933,235

TYPE INDICATOR

Vincent Chan, 84, Waterloo Road, B2, 18th Floor, Kowloon, Hong Kong

Filed Nov. 12, 1973, Ser. No. 414,916
Int. Cl.² B41J 29/42
U.S. Cl. 197—187 **5 Claims**



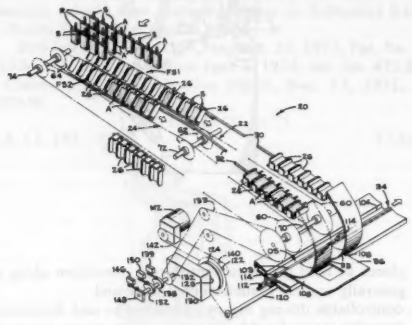
1. A type character visual indicator for an interlingual typewriter having a chassis, a roller having an axis said roller being rotatably mounted on said chassis and a drum having a plurality of rows of type characters arranged thereon in a pre-determined left to right order in alignment with said axis said drum being slidably mounted on said roller for movement along said axis a striker, and means for rotating and sliding said drum to a position to align a selected type character with said striker; said indicator comprising a window in said chassis extending parallel to said axis, an endless band having indicia thereon arranged in rows in reverse order to the type characters on said drum, drive means responsive to rotation of said roller to align the containing row of indicia said selected type on said endless band with said window, and pointer means attached to said drum movable and along said axis with said drum for indicating a particular indicium in said particular row corresponding to said selected type character.

3,933,236

ARTICLE TRANSFER MECHANISM

John S. Aterianus, Green Bay, Wis., and Robert J. Betschart, Sacramento, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 3, 1974, Ser. No. 466,742
Int. Cl.² B65G 47/26
U.S. Cl. 198—32 4 Claims



1. In an apparatus for transferring articles at high speed from a multi-lane intermittently driven inlet conveyor to a single lane output conveyor including, a pair of spaced transfer conveyors having arcuate discharge end portions and being driven in a direction normal to that of the output conveyor, means for effecting transfer of articles from a plurality of lanes of the multi-lane inlet conveyor into one of said transfer conveyors and for effecting transfer of the articles from other lanes of the inlet conveyor into the other transfer conveyor, carrier buckets each having an open top and an open end on the transfer conveyors for receiving and controlling the movement of the articles until the articles are aligned with said single lane output conveyor adjacent said arcuate discharge ends, drive means for driving each conveyor in timed relation; the improvement which comprises an arcuate shield around the arcuate discharge ends of the transfer conveyors for cooperating with the carrier buckets to prevent articles from egress from the open tops of the buckets until in position over the output conveyor and to then simultaneously transfer one article from a carrier bucket on each transfer conveyor directly into the single lane output conveyor, and arcuate cam means disposed around the arcuate discharge portions of the transfer conveyors in position for closing the open ends of the carrier buckets from article egress from said open ends, said arcuate cam means including downturned portions positioned to engage and cam articles out of the carrier pockets and into the output conveyor in the event the articles tend to stick to the carrier buckets.

3,933,237

CONVEYOR FOR A TRANSIT WAREHOUSE FOR PARCELLED CARGO TO BE STORED, PARTICULARLY FOR GOODS TRANSPORTED ON PALLETS

Robert Rotterman, Rebbergstrasse 81 d, CH-8102 Oberengstringen, Switzerland

Filed Aug. 28, 1974, Ser. No. 501,028
Claims priority, application Switzerland, Aug. 30, 1973, 12418/73
Int. Cl.² B65G 37/00
U.S. Cl. 198—37 6 Claims

1. Conveyor apparatus for parcelled goods, particularly for goods to be stored on pallets, with at least one conveyor path comprising a delivery station, a build-up stretch with a plurality of storage points to be passed in succession by the goods, and a pick-up station, comprising:

a first conveyor at the delivery station;

a second conveyor along the build-up stretch;

a third conveyor at the pick-up station said second conveyor having a beginning adjacent said first conveyor and an end adjacent said third conveyor;

driving means for moving said second conveyor independently of said other two conveyors in backward direction or together with either one of said other conveyors or both of them in forward direction; and

switching means for controlling said driving means and actuated by the passing goods so that, in a delivery mode, said goods are delivered by said first conveyor to accumulate at the beginning of said build-up stretch and, in a

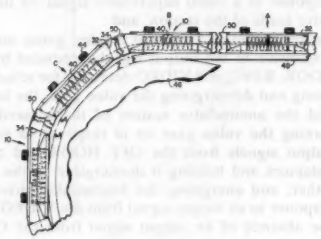
pick-up mode, said accumulated goods are moved to the end of said build-up stretch to be picked up by said third conveyor, and so that, in an alternating delivery and pick-up mode with an incompletely occupied build-up stretch, the totality of goods accumulated at the end of said build-up stretch are shifted backward to the beginning of said build-up stretch when said delivery station is served with goods awaiting to be delivered to said second conveyor, while said totality of goods are shifted to said end of said build-up stretch when said pick-up station is ready to pick up goods from said second conveyor, the shift to the beginning having priority so long as goods are awaiting delivery at said delivery station to an available storage point on said second conveyor.

3,933,238

SHIELD ASSEMBLY FOR FLEXIBLE BELT CARRIER MECHANISM

Richard J. Maguire, Kingston, Mass., assignor to The Gillette Company, Boston, Mass.

Filed June 19, 1974, Ser. No. 480,862
Int. Cl.² B65G 17/00
U.S. Cl. 198—189 7 Claims



1. In an endless flexible belt carrier mechanism including an endless flexible belt and a plurality of work holders attached to and spaced along said belt, the improvement which comprises a shield assembly for insertion in the spaces between said work holders and adapted to be moved along with said belt, said shield assembly comprising a pair of movable shield members biased outwardly from said shield assembly into contact with said work holders on either side of said shield assembly, whereby said shield assembly maintains contact with said work holders when said flexible carrier mechanism follows a straight path or a curved path.

3,933,239
CAPSULE POSITIONING MACHINE

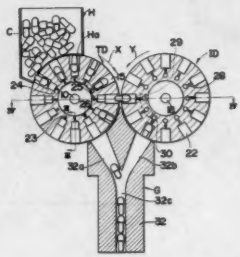
Haruhiko Yoshida, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 11, 1974, Ser. No. 522,865

Claims priority, application Japan, Nov. 15, 1973, 48-129027

Int. Cl.² B65G *47/24*

U.S. Cl. 198—287 **4 Claims**



1. A capsule positioning machine for supplying a plurality of capsules in a predetermined posture, each of said capsules being composed of a substantially cylindrical container and a substantially cylindrical cap which is mounted on and, therefore, overlaps one end portion of said container thereby defining a capsule chamber, said capsule positioning machine comprising:

a supply hopper for accommodating said capsules therein in any arbitrary posture and having the bottom opened;

a transport drum supported substantially below said bottom of said supply hopper for rotation in one direction and having a plurality of radially inwardly extending pockets which are spaced from each other at equal intervals around the periphery of said transport drum, said pockets being adapted to receive therein said capsules in any arbitrary posture from said supply hopper, the interior of each of said pockets being stepped to provide a large diameter portion adjacent the periphery of said transport drum and a reduced diameter portion remote from the periphery of said transport drum, each of said pockets having a size satisfying the following relations,

$$D < D' \leqq d < d' \text{ and}$$

$$l < La$$

wherein D represents an outer diameter of the container, D′ represents a diameter of the reduced diameter portion of said pocket, *d* represents an outer diameter of the cap, *d′* represents a diameter of the large diameter portion of the same pocket, *l* represents the depth of the reduced diameter portion of the same pocket and La represents the difference between the total length of the capsule and the length of the cap of the same capsule;

means for driving said transport drum so as to rotate said transport drum in said one direction, said transport drum being, during each rotation thereof, sequentially brought to supply, ejecting and delivery stations located around the transport drum in the direction of rotation of said transport drum;

first means operatively positioned for permitting said capsules to be received in the corresponding pockets in said transport drum at said supply station in any arbitrary posture and for permitting said capsules held within said pockets in said transport drum to be transferred towards said ejecting station as said transport drum rotates, comprising means for drawing air within each of said pockets to create a substantial vacuum therein;

second mean operatively positioned for permitting only the capsules, which are held in the associated pockets with the cap radially outwardly oriented, to be ejected out of said associated pockets at said ejecting station of said transport drum;

third means operatively positioned for permitting the capsules, which have been transported to said delivery station of said transport drum while held in the associated pockets with the cap radially inwardly oriented, to be ejected out of said associated pockets at said delivery station; and

fourth means positioned adjacent said transport drum at said delivery station for receiving the capsules, which have successively been ejected out of said pockets at said delivery station with the container outwardly oriented, and for subsequently feeding them to a subsequent process.

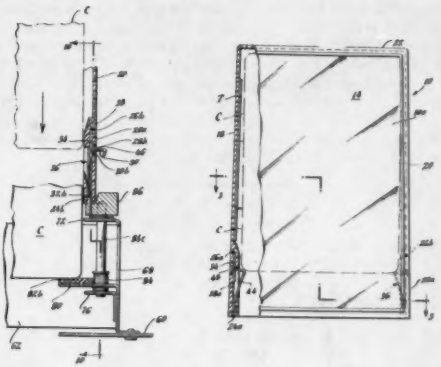
3,933,240
ANTI-THEFT SECURITY CONTAINER

David R. Humble, Lauderhill, Fla., assignor to Sensormatic Electronics Corporation, Hollywood, Fla.

Filed Oct. 15, 1974, Ser. No. 514,490

Int. Cl.² B65D *55/04*; B65B *69/00*

U.S. Cl. 206—1.5 **16 Claims**



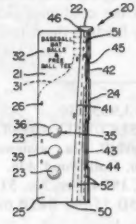
1. Apparatus for preventing unauthorized removal of an article of merchandise from a protected area which comprises: a container defining a main opening therein for receiving said article and at least two spaced key openings adjacent said main opening: an electromagnetic reradiator carried by said container; first and second resilient clips carried by said container, each having a normal first position clear of said main opening but bendable to a second position blocking said main opening; means for latching said clips in said second position; and an article release member including at least two spaced key means simultaneously advanceable into said key openings for shifting each of said clips from said second position to said first position.

16. A release mechanism for an article holding container which comprises: a base; first and second key means supported by said base in spaced apart relationship; a housing substantially enclosing said base and key means and defining a top opening overlying said key means; actuating plate means within said housing normally positioned against said top opening but downwardly movable upon the application of force, said actuating plate means defining first and second passages to receive said key means therethrough and an article opening positioned to receive therethrough an article released from said container.

3,933,241
PACKAGE CONSTRUCTION

Joseph V. Tassone, 2425 Rawnsdale Road, Kettering, Ohio 45440, and James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Filed Dec. 11, 1973, Ser. No. 423,705. The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.
Int. Cl.² B65D *69/00, 85/00*
U.S. Cl. 206—223 8 Claims

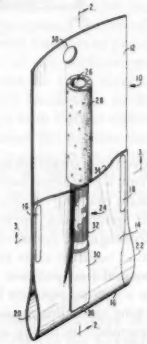


1. A package construction comprising a collapsible baseball and softball tee member for supporting a ball to be hit by a baseball and softball type ball bat when said tee member is erected whereby said tee member in said erected condition thereof is adapted to support a ball for striking by a batter at a vertical height which is at least equal to the vertical height defined by the batter's knee, and one of a baseball and softball type ball bat and ball being held by said tee member disposed thereabout in a collapsed condition and forming therewith a self-contained package construction.

3,933,242
REED CONTAINER

William A. Roscoe, 100 Union St., Erwin, Tenn. 37650

Filed Nov. 14, 1974, Ser. No. 523,948
Int. Cl.² B65D *85/54*
U.S. Cl. 206—314 4 Claims

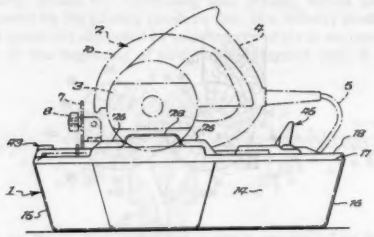


1. A reed container for double reeds having an enlarged shoulder portion spaced from the tip of the reed comprising a flexible, substantially rectangular sheet of plastic material folded partially back upon itself and fastening means securing said folded back portion to said sheet along the edges thereof in spaced relation to the fold portion to provide ventilation gaps adjacent said fold portion, the edge of said folded back portion between said fastening means being spaced from the fold portion a sufficient distance to prevent the tip of a double reed from contacting the fold portion when a double reed is inserted between said sheet and said folded back portion with the shoulder portion of the double reed resting on said edge.

3,933,243
SUPPORT AND STORAGE TRAY

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Oct. 23, 1973, Ser. No. 408,305
Int. Cl.² B65D *85/54, 85/68*
U.S. Cl. 206—349 8 Claims

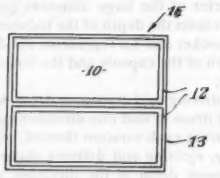


1. In combination with a power tool of the type having a handle, a driven work element, and a drive motor for said element, a support and storage tray therefor comprising means for supporting said tool in a storage position with said handle oriented as a carry handle for said tray, means for releasably latching said tool in said position, whereby said tray supports said tool for storage and is transported with said tool when the latter is carried by its handle and wherein said tray is compartmented to receive at least one accessory for said tool, said motor overlying said accessory compartment and retaining the accessory therein when said tool is in said storage position.

3,933,244
SHRINK-WRAPPING OF ARTICLES

Merfyn Jones Hughes, Little Sutton; Derek William Shorten, Westerfield, and Graham Westley Smith, Witnesham, all of England, assignors to Bakelite Xylonite Limited, London, England

Filed Dec. 5, 1973, Ser. No. 421,812
Claims priority, application United Kingdom, Dec. 12, 1972, 57461/72
Int. Cl.² B65D *65/00;* B65B *53/02*
U.S. Cl. 206—497 26 Claims



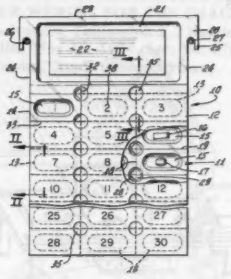
15. Double-wrap pack comprising a collation of a plurality of first packages each comprising at least one article wrapped in first ethylene polymer film, said collation being shrink-wrapped in a second ethylene polymer film, wherein one of said film contains an anti-block additive present in an amoutn between the effective anti-blocking amount of said additive and the self-heat-sealing-preventing amount of said additive, and the other of said films is substantially free from anti-blocking additive.

3,933,245

ARTICLE HOLDING AND DISPENSING CONTAINER

Patrick E. Mullen, 828 Fifth St., Apt. 9, Santa Monica, Calif. 90403

Filed July 9, 1973, Ser. No. 377,557
Int. Cl.² B65D 83/04
U.S. Cl. 206—498 7 Claims



1. In an article holding and dispensing container having an article receiving holding compartmental tray, a plurality of vertical frangible score lines associated with said tray separating generally aligned vertical rows of a plurality of article receiving pockets formed in said tray, pockets in said vertical rows being generally horizontally aligned with pockets in adjacent vertical rows, and horizontal frangible score lines associated with said tray separating aligned horizontal rows of said pockets, said pockets being open on one side thereof and closure means associated with said tray closing off the open sides of said pockets, the improvement which comprises:

said closure means having a plurality of vertical frangible score lines generally aligned with the vertical score lines of said holding compartment and a plurality of horizontal frangible score lines generally aligned with the horizontal score lines of said holding compartment, said closure means being heat-sealed to said holding compartment; and

article removal facilitating means associated with both said holding compartment and said closure means at the intersection of said horizontal and vertical score lines, wherein said article removal facilitating means includes a plurality of non-heat-sealed zones in the areas of the intersection of the vertical and horizontal score lines of said closure means and at the intersection of the vertical and horizontal score lines of said holding compartment.

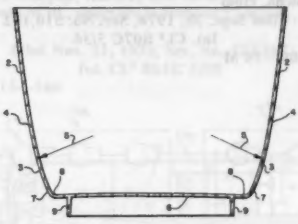
3,933,246

CONTAINER

Edward W. Fulton, c/o The Alan I. W. Frank Corp., Exton, Pa. 19341

Continuation of Ser. No. 312,533, Dec. 6, 1972, abandoned. This application Dec. 24, 1974, Ser. No. 536,067
Int. Cl.² B65D 21/02
U.S. Cl. 206—520 5 Claims

1. A container of generally circular shape defining a generally cup-shaped article including an inverted frusto-conical upper side wall portion of uniform thickness throughout; a lower side wall portion also of the same uniform thickness as that of the upper side wall portion, said lower side wall portion defining a curvilinear surface of progressively decreasing diameter; a flat, disciform bottom wall merging with the lowermost part of said curvilinear side wall portion at smoothly curved juncture having a radius of curvature substantially less than that of said curvilinear bottom portion of said side wall, said bottom wall being of identical uniform thickness as that of said side wall portions; the bottom wall having a dependent cylindrical foot formed integrally therewith, the diameter of said dependent foot being less than the diameter of said disciform bottom wall and the vertical height of said dependent foot being such that when two or more containers are nested



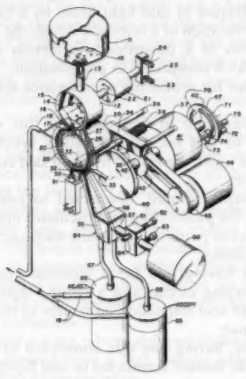
the side wall of the uppermost container is slightly spaced from the inner surface of the side wall of the lowermost container.

3,933,247

HIGH SPEED MAGNETIC CORE HANDLER

Nathan R. Smith, Blaine, Minn., assignor to Micro Component Technology, Inc., Minneapolis, Minn.

Filed Dec. 14, 1973, Ser. No. 424,701
Int. Cl.² B07C 5/344
U.S. Cl. 209—73 18 Claims



1. Magnetic core handling apparatus comprising:

a. moving means moving a plurality of magnetic cores to a retrieving station having an orifice larger than a single, but smaller than a double, diameter of said magnetic cores;

b. index wheel means having a plurality of core holding devices equally spaced around the periphery thereof, said wheel means operably communicating with said orifice of said moving means for consecutively retrieving a single core of said plurality and holding said cores;

c. magnetic core testing means disposed at a station downstream from said retrieving station for testing the magnetic characteristics of said magnetic cores;

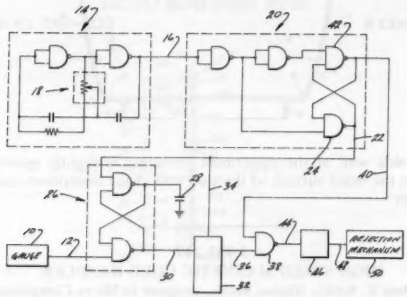
d. intermittantly energized driving means operably connected to said index wheel means and thereby transporting said magnetic cores intermittently from said retrieving station to said testing station; and,

e. controlling means connected between said driving means and said magnetic core testing means for controlling the intermittent movement of said driving means.

3,933,248
BIRD-SWING DETECTOR

David A. Damm; John W. Juvinall, both of Toledo, and Gerald F. Scherf, Holland, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 30, 1974, Ser. No. 510,182
Int. Cl.² B07C 5/36
U.S. Cl. 209—74 M 1 Claim



1. In an apparatus for the inspection of containers for bird-swing defects of the type wherein said containers are transported in single file by an endless moving conveyor to and through said apparatus, wherein said containers are inspected by a light beam while moving through said apparatus, and wherein deflection of said light beam by a bird-swing defect will cause generation of a rejection signal, the improvement in said apparatus of a downstream rejection system for said apparatus which comprises, in combination:

an oscillator for producing a continuous series of electrical pulses;

means, connected to said oscillator, for varying the frequency of said oscillator to allow synchronism of said frequency with the rate of travel of said containers on said conveyor;

a wave-shaping circuit, connected to said oscillator, for shaping the pulses from said oscillator into a substantially square wave pattern at the same frequency as said oscillator frequency;

a flip-flop having one input terminal connected to said wave-shaping circuit and a second input terminal connected to said inspection apparatus to receive said rejection signal;

a capacitor, having one side connected to ground and the other side thereof connected to said flip-flop, for delaying the resetting of said flip-flop a predetermined length of time after receipt of a signal from said wave-shaping circuit, the value of said capacitor fixing said pre-determined length of time of said delay;

a multi-stage shift register having a clocking input terminal connected to said wave-shaping circuit and a signal input terminal connected to an output terminal of said flip-flop;

an output electronic gate having one input terminal connected to said wave-shaping circuit and a second input terminal connected to an output terminal of said multi-stage shift register, said output electronic gate generating an output signal at an output terminal thereof only when both said multi-stage shift register and said wave-shaping circuit furnish a signal thereto;

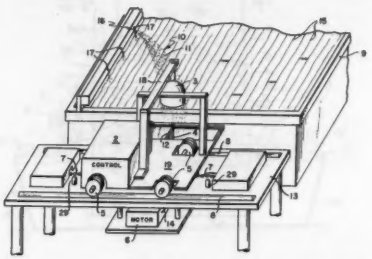
a one-shot unit, connected to said output terminal of said output electronic gate, for generating a signal in response to a signal from said output electronic gate; and

rejection means, responsive to a signal from said one-shot unit, for removing containers from said conveyor, said rejection means being positioned at a location adjacent said conveyor and downstream from said inspection apparatus.

3,933,249
PRODUCT SEPARATOR

Robert A. Welsh, Bethel Park, and Albert W. Deurbrouck, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 26, 1973, Ser. No. 344,697
Int. Cl.² B07C 5/342
U.S. Cl. 209—75 11 Claims



1. A material separating apparatus for separting a concentrate from the material comprising:

a primary material separator means having a surface with a recovery end for initially separating out a concentrate from the material and to visually indicate the concentrate on its surface;

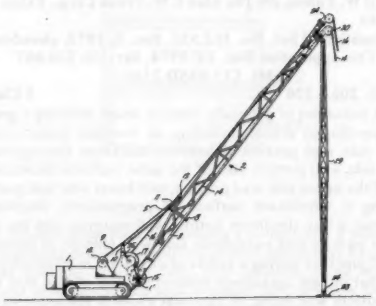
a secondary material separator operatively associated with said primary separator at its recovery end to separate and recover said concentrates based on a characteristic quality of its reflected light;

said secondary separator including a light responsive detecting means to monitor the concentrate on the primary separator surface, a material separator and recovery means, and a control drive interconnecting between them whereby the material separator of the secondary separator is capable of being moved in response to variations on the monitored concentrate on the primary surface as a function of the characteristic quality of the detected reflected light.

3,933,250
GUY CRANE JIB TIP PROP

Alvin M. Roberts, and Kenneth E. Roberts, both of 705 W. McBryde, Montesano, Wash. 98563

Filed Nov. 1, 1974, Ser. No. 519,823
Int. Cl.² B66C 23/94
U.S. Cl. 212—58 R 6 Claims



1. In a guy jib crane comprising a crane jib, an upright prop supporting the tip of said crane jib, a hauling line extending in

one generally horizontal direction laterally of said crane jib from its tip, and a guy line extending generally horizontally laterally from the tip of said crane jib generally in the direction opposite said hauling line.

3,933,251

X-RAY EXAMINATION APPARATUS COMPRISING A COUNTER-WEIGHT FOR THE IMAGE SECTION

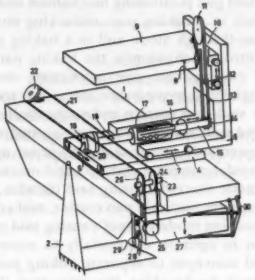
Walter Schmedemann, Timmerloh 3, 2 Hamburg 62, Germany

Filed May 15, 1974, Ser. No. 470,274

Claims priority, application Germany, May 16, 1973, 2324699

Int. Cl.² G03B 41/16

U.S. Cl. 250—439 2 Claims



1. X-ray examination apparatus comprising:

a frame having a longitudinal direction, a transverse direction and a compression direction, all mutually perpendicular to each other;

a principal carriage mounted on said frame for movement in the longitudinal direction;

a transverse carriage mounted on said principal carriage for movement in the transverse direction;

an image section mounted on said transverse carriage for movement in the compression direction;

a first shaft rotatively mounted along the transverse direction on said transverse carriage;

a second shaft rotatively mounted in the transverse direction on said principal carriage;

means for mechanically coupling rectilinear movement of said image section in the compression direction to rotary movement of said first shaft;

means for mechanically coupling rotary movement of said first shaft to rotary movement of said second shaft while permitting relative rectilinear movement thereof in the transverse direction;

a belt drum coaxially mounted on said second shaft for common rotation therewith;

a counterweight mounted on said frame for movement in the compression direction;

a belt having two ends, both of which are attached to said drum, so that rotation of said drum simultaneously winds both ends of said belt onto or off of said drum thereby increasing or decreasing the remaining length of said belt, the ends of said belt extending away from each other in the longitudinal direction;

a reversing guide roller mounted on said counterweight for reversing the direction of said belt; and

guide rollers mounted on said frame for directing said belt toward and away from said reversing guide roller,

whereby movement of said image section in the compression direction causes opposite movement of said counterweight in the compression direction, said counterweight counterbalancing the weight of said image section.

3,933,252

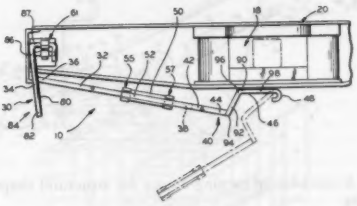
RAILROAD CAR UNCOUPLING LEVER WITH ANTIFRICTION SLIDEWAY ARRANGEMENT

Richard F. Murphy, Aurora, and Osvaldo F. Chierici, Elmhurst, both of Ill., assignors to Holland Company, Lombard, Ill.

Filed Nov. 11, 1974, Ser. No. 522,467

Int. Cl.² B61G 3/08

U.S. Cl. 213—166 16 Claims



1. In an uncoupling lever device for a railroad car having a coupler mounted at one end thereof for side to side swinging movement and movement longitudinally of the car in response to buff and draft forces and including a lock lifter for uncoupling the coupler, with said uncoupling device including a lever assembly comprising a lock lifter section including a hook eye at one end thereof adapted to operatively engage the lock lifter for support by the coupler, and a handle section including a handle portion at one end thereof adapted to be pivotally secured to the car to one side of the end of the car to swing about a pivot point to move said hook eye portion to operate said lock lifter, for mounting the lever assembly in operative relation on the car, with the handle section comprising an elongate rectilinear bar of polygonal transverse cross-sectional configuration, with the handle portion being fixed to one end of said bar, and the lock lifter section comprising an elongate rectilinear bar having the hook eye affixed to one end of same, and with the lock lifter section bar adjacent the other end of same including an elongate slideway extending generally longitudinally same, and the handle section bar slidably received in said slideway in cranking relation to the lock lifter section bar for accommodating shifting action of the lock lifter section relative to the handle section on side to side swinging movement of the coupler, the improvement wherein:

said slideway comprises:

an elongate tube having a bore defining slideway surfacing thereabout formed from a high density polymer having self-lubricating characteristics,

said tube being open at either end of same for free travel of said lock lifter section slideway longitudinally of said handle section bar to, on movement of said lock lifter section bar toward the handle portion, dispose the other end of said handle section bar exteriorly of said slideway at the hook eye end of same for accommodating contraction of said device under coupler swing when the coupler swings toward said handle portion,

said bars being formed for free travel of said lock lifter section bar relative to said handle section bar, on said movement to project said other end of said handle section bar from said slideway, to adjacent said one end of said lock lifter section bar, and for free travel of said slideway lengthwise of said handle section bar,

said bars being proportioned to dispose said other end of said handle section bar intermediate said one end of said lock lifter section bar and the slideway inboard end when the coupler is centered relative to the car,

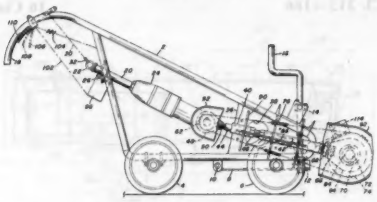
and means for fixing said tube to said lock lifter section bar against movement longitudinally of said lock lifter section bar, with said tube being free of bonded connection to said lock lifter section bar.

3,933,253

MECHANICAL TURNING DEVICE FOR STRUCTURAL SHAPES

Keith Gardner, 49 N. 300 East, Spanish Fork, Utah 84660

Filed July 30, 1974, Ser. No. 493,016
Int. Cl.² B65G 7/00
U.S. Cl. 214—1 Q 4 Claims



1. A mechanical turning device for structural shapes comprising

a frame member,

a pair of spaced apart bearings mounted on one end of the frame and with one bearing on one side of the frame and the other bearing on the other side of the frame,

a hollow drive shaft supported to rotate in the bearings,

an extension shaft fitting inside the hollow drive shaft and adapted for rotation with the drive shaft and for longitudinal movement with respect to the drive shaft,

turning jaws mounted on the end of the extension shaft for engaging the end of a structural shape,

means connected to the drive shaft for rotating the drive shaft selectively in either direction of rotation to a desired angle of rotation,

means connected to the extension shaft for selectively moving the extension shaft longitudinally with respect to the drive shaft, and

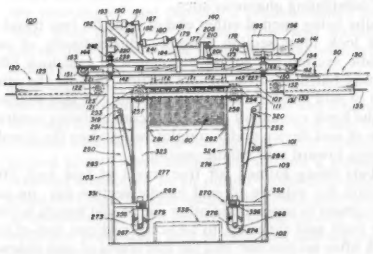
a pair of wheels and a supporting axle mounted on the frame for movement of the device to a position for engaging the end of a structural shape.

3,933,254

STACKER-UNSTACKER

Willis C. Pulver, Burbank, and Henry A. Heide, Addison, both of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.

Filed Mar. 8, 1973, Ser. No. 339,314
Int. Cl.² B65G 60/00
U.S. Cl. 214—6 DS 20 Claims



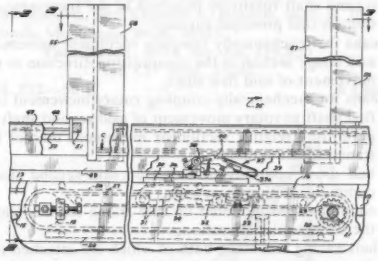
1. A machine for both feeding into a stack and removing from a stack baking pans and the like, said machine comprising a transfer conveyor for conveying baking pans to the stack, away from the stack and past the stack, said transfer conveyor including attraction means for attracting the baking pans and holding them in engagement with said transfer conveyor during transfer of the baking pans thereby, a pan carrier mounted below said transfer conveyor in position to receive a pan dropped therefrom, said attraction means including a pan positioning mechanism for sequentially separating baking pans from said transfer conveyor and sequentially depositing the baking pans upon said pan carrier to form a stack of pans thereon and for sequentially lifting baking pans from said pan carrier and sequentially engaging the baking pans with said transfer conveyor, said pan positioning mechanism being movable above and away from said transfer conveyor for separating baking pans therefrom and being movable below said transfer conveyor for lifting baking pans from said pan carrier, carrier drive mechanism for moving said pan carrier upwardly and toward said transfer conveyor as pans are unstacked from said pan carrier and onto said transfer conveyor and for moving said pan carrier downwardly and away from said transfer conveyor as baking pans are stacked on the said pan carrier from said transfer conveyor, and a control mechanism for selectively and sequentially operating said transfer conveyor and said pan positioning mechanism and said carrier drive mechanism in a baking pan unstacking mode and in a baking pan pass-through mode and in a baking pan stacking mode, said control mechanism in the baking pan unstacking mode thereof causing said pan positioning mechanism to operate sequentially to move below said conveyor to lift baking pans from said pan carrier and sequentially engage the baking pans and said transfer conveyor as said carrier drive mechanism sequentially moves said pan carrier upwardly and toward said transfer conveyor, said control mechanism in the pass-through mode thereof causing said transfer conveyor to carry the baking pans past said pan carrier, said control mechanism in the stacking mode thereof causing said pan positioning mechanism to operate sequentially to move above and away from said conveyor to separate baking pans from said transfer conveyor by breaking the attraction therebetween and sequentially deposit the baking pans upon said pan carrier as said pan carrier drive mechanism sequentially moves said pan carrier downwardly and away from said transfer conveyor.

3,933,255

CASE MAGAZINE AND FEED APPARATUS

Gaylerd M. Lieder, and Harold K. Fox, both of Minneapolis, Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Dec. 6, 1973, Ser. No. 422,308
Int. Cl.² B65G 59/00
U.S. Cl. 214—8.5 K 4 Claims



1. For removing a case from a vertical stack of cases in horizontal, flat folded conditions that have elongated first edge portions and elongated edge portions opposite the first edge portions, a frame, longitudinally elongated slide means on the frame for supporting the stack of cases, means mounted on the frame for retaining the cases in the stack in generally vertical alignment while permitting the lowermost case of the stack being slid along the slide means from beneath the stack, stripper means mounted on the frame for moving the lowermost case along the slide means from beneath the stack and lifter means mounted on the vertical alignment means for engaging cases in the stack that are located more than the

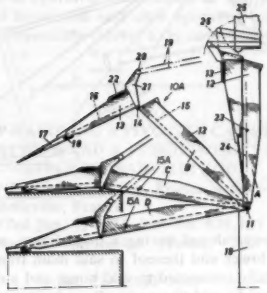
thickness of a plurality of cases above the slide means to lift engaged cases and retain the lifted cases in vertical spaced relationship to the remainder of the cases in the stack and separated therefrom, and subsequently release the lifted cases to fall toward the slide means, the lifter means including a generally vertical case engaging lifter member, a vertically elongated cam member having at least a lower portion that extends downwardly and away from the stack, vertically movable means for mounting the case engaging lifter member and vertically movably engaging the cam member lower portion to move the case engaging lifter member toward the adjacent case edge portions as it moves vertically upwardly along said cam member lower portion, power means secured to the vertically movable means for selectively moving the vertically movable means upwardly and downwardly in engagement with the cam member and means for mounting the cam member and power means on the vertical alignment means.

3,933,256

SHIP'S LOADING RAMP

Per Fagerlund, Torslanda, Sweden, assignor to Navire Cargo Gear International AB, Goteborg, Sweden

Filed Apr. 22, 1974, Ser. No. 463,167
Claims priority, application Sweden, May 7, 1973, 7306337
Int. Cl.² B65G 11/00
U.S. Cl. 214—15 R **4 Claims**



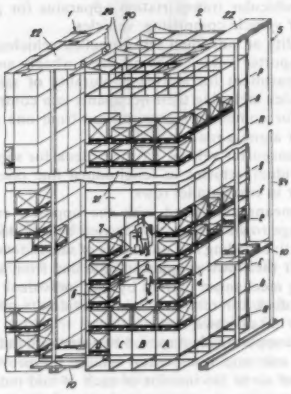
1. A ship's loading ramp including two spaced substantially parallel side beams, and a travelling track carried by the side beams said side beams and said tracks being divided transversely into inner and outer portions, first hinge means for swingably mounted the inner portion of said ramp at the ship, second hinge means interconnecting the inner and outer portions of the ramp, winch means for operating the ramp between a folded and a vertically staved position on board the ship and an extended working position, and further including a balancing arm at each side beam having one end pivotably mounted thereto adjacent to the second hinge means and extending its other end above the upper edge of the side beam, a sheave means at the other end of each arm for guiding a wire from the winch means, and an actuator, mounted between one of the beam portions and the pertaining balancing arm for adjusting the angular position of the latter.

3,933,257

WAREHOUSE SHELVING SYSTEM

Reinold Karl Weber, August-Siebert-Strasse 4, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 245,963, April 20, 1972, abandoned. This application July 18, 1974, Ser. No. 489,481
Claims priority, application Germany, Dec. 21, 1973, 2363795
Int. Cl.² B65G 1/06
U.S. Cl. 214—16.4 A **3 Claims**



1. A shelving system for the storage of pallet-size loads, comprising:

a plurality of stacks of shelves each vertically subdivided into a multiplicity of tiers positioned on the same levels in said plurality of stacks, longitudinally adjoining stacks being separated by a transversely extending aisle, each stack having a depth of several storage spaces each accommodating a pallet-size load, said aisle having a depth substantially equaling at least twice the depth of a storage space;

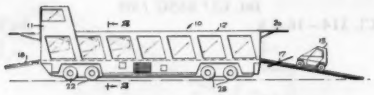
hoisting means in said aisle including a pallet carrier alignable with the tiers of the adjoining stack on any level, said carrier comprising a platform, a longitudinally extendable arm on said platform substantially spanning the depth of said aisle when in a contracted position, lifting means alongside said arm on said platform, and transfer means mounted on said lifting means and longitudinally displaceable thereon between opposite extremities of said arm, the length of said transfer means being less than the length of said arm in said contracted position thereof; and

mechanism on said carrier for placing said transfer means under a pallet riding on one extremity of the contracted arm, actuating said lifting means to engage said transfer means with the pallet and raise the latter off said arm, displacing said transfer means on said lifting means into an alternate position relative to said arm, depositing the pallet on the other extremity of said arm with disengagement of said transfer means therefrom, and extending said arm into the adjoining stack on the side of said other extremity, said stacks being provided at certain levels with throughgoing transverse passageways adjoining a single row of storage spaces next to said aisle.

3,933,258
VEHICULAR TRANSPORTATION SYSTEM

Robert W. Forsyth, and John P. Forsyth, both of 1517 N. 3rd Ave., Upland, Calif. 91786

Filed Jan. 2, 1974, Ser. No. 430,186
Int. Cl.² B60P *1/00*
U.S. Cl. 214—85 **13 Claims**



1. A vehicular transportation apparatus for processing a passenger vehicle comprising: vehicles

a plurality of individual self-propelled vehicles;

a transporter vehicle having tired wheels and a storage compartment for storing a plurality of said individual vehciles including their occupants in a controlled grouping for combined transportation from one place to another along a roadway;

said transporter vehicle having a deck for supporting said individual vehicles in longitudinal line one behind the other in two parallel rows;

ramp means associated with the opposite ends of each storage row and operably carried by said deck to permit selective loading and unloading of said individual vehicles under their own propulsion onto and from said deck;

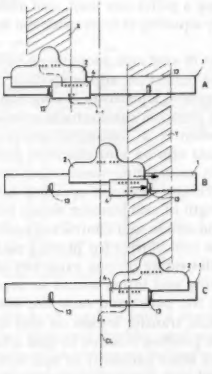
locking mechanism carried by said individual vehicles and said deck for retaining said individual vehicles on said deck in said rows; and

means cooperatively disposed between said individual vehicles and said transporter vehicle for providing conditioned air to the interior of each of said individual vehicles.

3,933,259
SIDE-SHIFT BACKHOE

Alasdair John Irving, Epping, Australia, assignor to J. I. Case Company, Racine, Wis.

Filed July 2, 1973, Ser. No. 375,914
Claims priority, application Australia, July 3, 1972, 9553/72
Int. Cl.² B66F *9/00*
U.S. Cl. 214—138 C **5 Claims**



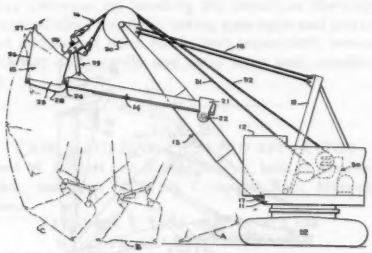
1. A side-shift backhoe comprising a supporting frame for connection to a tractor, a slide member mounted on and for lateral movement with respect to said frame, a working member mounted on said slide member, and an operator's station having control means for said slide member and said working member, said operator's station being slidably mounted on said slide member for movement parallel to said slide member, stop members secured to said frame in spaced relation at either side of said station, said stop members being engaged by said station as said slide member moves with respect to said frame whereby the relative position of said station with respect to said slide member may be changed in either direction.

2. A side-shift backhoe comprising a supporting frame for connection to a tractor, a slide member mounted on and for lateral movement with respect to said frame, a working member mounted on said slide member and an operator's station having control means for said slide member and said working member, said operator's station being slidably mounted on said frame for lateral offset parallel movement with respect to said frame and said slide member, stop members extending from either end of the slide member, and a projection on said station adapted to be engaged by said stop members as the slide member moves with respect to said frame whereby the relative position of the slide to the station may be changed in either direction.

3,933,260
HOIST SYSTEM FOR POWER SHOVELS

Loren Kronlokken, Edina, Minn., and Guenter Fritz Lehmann, Marion, Ohio, assignors to Marion Power Shovel Co., Inc., Marion, Ohio

Filed Sept. 14, 1973, Ser. No. 397,586
Int. Cl.² B66C *3/02*
U.S. Cl. 214—138 R **30 Claims**



1. In a power shovel having a main frame, a boom connected at a lower end thereof to said main frame, a dipper handle pivotally connected to said boom and a dipper pivotally connected to said dipper handle, a hoist system for said dipper including means for varying the pitch thereof comprising a common hoist drum mounted on said main frame, a first hoist line operatively connected at one end thereof to said hoist drum, passing over a point on said boom and operatively connected at the opposite end thereof to said dipper handle, a second hoist line operatively connected at one end thereof to said hoist drum, passing over a point on said boom and operatively connected at the opposite end thereof to said dipper, and means for selectively displacing one of said hoist lines relative to the other thereof.

3,933,261
CONSTRUCTION EQUIPMENT

Jerome L. Marostica, and William L. McLaughlin, both of Anchorage, Alaska, assignors to BHB Corporation, Anchorage, Alaska

Filed Apr. 16, 1974, Ser. No. 461,455
Int. Cl.² B66F *9/00*
U.S. Cl. 214—138 R **7 Claims**

1. A mobile, self-contained construction machine comprising, in combination:

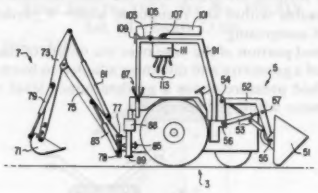
an automotive vehicle presenting a support platform and including a cab having a roof arranged to support high

level weight loads, said cab defining an enclosure to be occupied by an operator;

a backhoe system supported by said platform and extending from one side of said vehicle, said backhoe system being mounted to said platform for pivotal movement in a horizontal plane relative to said vehicle;

an extendible folding boom including at least two articulated members, and pivotally mounted on said roof of said cab and extending upwardly therefrom;

a pole claw composed of a pair of opposed limbs pivotally mounted at the free end of said boom, and claw operating



means connected for pivoting said limbs in directions to respectively open and close said pole claw;

a cable carried by said boom and means at the free end of said boom for guiding the end of said cable so that the end of said cable extends from said guiding means downwardly from the free end of said boom;

a chain and hook connected to the end of said cable; and

control means disposed in said cab for use by an operator therein and operatively connected to said backhoe system, said boom and said claw operating means for enabling the operation thereof to be controlled by the operator.

3,933,262

METHOD OF HANDLING A PIVOTING CAB OF A PUBLIC WORKS MACHINE AND A PUBLIC WORKS MACHINE APPLYING SAID METHOD

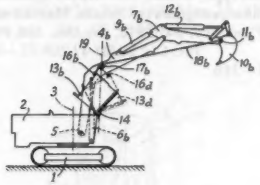
Michel M. Cresp, Ormoy-Villiers, France, assignor to Poclain, Le Plessis Belleville, France

Filed Jan. 7, 1975, Ser. No. 539,187

Claims priority, application France, Jan. 15, 1974, 74.01315

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 R **8 Claims**



2. A public works machine comprising a frame, an arm mounted to pivot with respect to the frame about a first axis and supporting the working tool, a movable cab, pivot means connecting said cab to said frame for enabling said cab to pivot with respect to the frame about a second axis substantially parallel to the first axis, fastener means connected to the cab at a location spaced from the second axis and tie means connecting said fastener means to said arm for effecting pivotal movement of said cab by pivoting of said arm as desired.

3,933,263

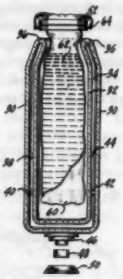
EASILY CLEANSABLE CONTAINER

Florence Frew, 13 Thoreau Drive, Englishtown, N.J. 07726, and Janet Indiveri, 15 Paper Mill Road, Cherry Hill, N.J. 08003

Filed Mar. 25, 1974, Ser. No. 454,151

Int. Cl.² A47J *41/00*

U.S. Cl. 215—13 A **6 Claims**



1. An easily cleansable container comprising:

an outer housing;

an inner vacuum bottle providing a substantially thermally isolated environment;

a disposable liner situated within said vacuum bottle and adapted to receive liquids, solids or the like for retention in said environment, said liner being arranged to fold around at least a portion of said housing; and

a stopper positioned to jointly close said inner bottle and said disposable liner to hold said liquids, solids or the like in place when it is desired to keep them at their initial temperatures, and positioned to jointly open said inner bottle and dispoable liner when removed to provide access to the liquids, solids or the like held within

wherein said disposable liner is of a flexible, stretchable plastic composition to hold against said portion of the outer housing;

wherein said disposable liner incorporates an elasticized material band around an outer edge thereof, positioned to further hold the liner against said portion of the outer housing and to present an easy manner of grasping the liner for removal when it is desired to be discarded; and

wherein the portion of the outer housing around which said disposable liner is folded includes a lip portion arranged to cooperate with said elasticized band to hold it in place and the liner further against said housing in preventing total insertion of said liner in said vacuum bottle.

3,933,264

CONTAINER AND CAP WITH TEAR STRIP

Anthony T. Rossi, Bradenton, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.

Filed Sept. 20, 1974, Ser. No. 507,973

Int. Cl.² B65D *41/32*

U.S. Cl. 215—254 **5 Claims**

1. A molded plastic container cap for closing a container having a circumferentially extending interlock projection, said cap including:

a cover section comprising:

a generally central raised portion, and

a sloping edge portion sloping downwardly and radially outwardly from said central raised portion; and

an inverted, generally U-shaped seating section for receiving an upper side wall portion of said container, said seating section comprising:

a wall portion integral with and extending upwardly from said sloping edge portion of said cover section,

an outer, circumferentially extending, depending skirt portion for embracing the outer side of said container side wall portion,

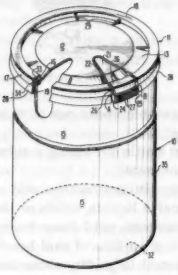
said skirt portion including a circumferentially extending seating recess, for interlocking with said interlock projection of said container, and

said wall portion and said skirt section establishing a raised circumferential ridge projecting above said sloping edge portion of said cover section;

said cover section and said seating section including a tear strip portion of the cap for establishing a drinking and pouring access opening through said cap, said tear strip portion being bounded by

slots extending upwardly from the bottom of said skirt portion toward but short of the top of said circumferential ridge, and

grooves commencing with the termination of said slots and extending upwardly along said skirt portion, across said ridge, downwardly along said wall portion of said seating portion, across said sloping edge portion and at



least part of said central portion in generally converging directions;

means disposed adjacent the portion of said grooves extending across said sloping edge portion for rigidifying said cap by engaging said sloping edge portion and engaging said wall portion;

the portion of said ridge between said grooves being operable to establish a fulcrum about which the portion of said skirt bounded by said grooves is pivotable in response to lifting of the portion of said skirt bounded by said slots; and,

the portion of the juncture of said wall portion and said downwardly sloping edge portion bounded by said grooves being operable to establish a rigidified zone contiguous with the outer periphery of said downward sloping edge portion, about which rigidified zone the portion of said wall bounded by said grooves is rotatable toward said downwardly sloping edge portion to permit removal of said tear strip by movement of a portion of said tear strip bounded by said slots in a smooth, upward and inward, arcuate path.

3,933,265

BOTTLE CLOSURE

Jac H. Karlan, 5992 Netherland Ave., Riverdale, N.Y. 10471

Filed Sept. 19, 1972, Ser. No. 290,418

Int. Cl.[2] B65D *51/16*

U.S. Cl. 215—260 **8 Claims**

1. A closure for a receptacle having an a first external bead in the vicinity of the mouth thereof and a second external bead lower than the first bead, comprising

a one-piece closure construction having:

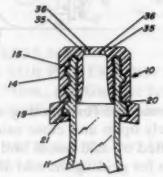
a hollow flexible annular insert of flexible thermoset material integral with the base and of at least equivalent flexibility depending from the base insertable within the receptacle and adapted to press and increasingly seal against and conform to an internal wall of the receptacle under the influence of increasing pressure within the receptacle,

corrugations on said insert for pressing against the internal wall of the receptacle,

hollow outer annular wall of flexible thermoset synthetic material, shorter than said insert, integral with the base and surrounding the insert and depending from the base for substantially surrounding and covering the first bead on the receptacle and adapted to press and increasingly seal against the bead under the influence of increasing pressure within the receptacle,

means formed integrally with the base for relieving fluid pressures within the receptacle above a predetermined level comprising

a thinned portion of the base over the mouth of the receptacle of a geometry and thickness adapted to burst at a level of fluid pressure above a predetermined level of sealing pressure within the receptacle,



severable skirt means extending from the hollow outer annular wall and adapted to engage the second external bead tightly, said skirt means having flexibility and stretch characteristics which facilitate advancing the skirt axially over the second external bead without tearing the skirt means, the outer annular wall or the skirt means from the outer annular wall, said skirt means further having annular shoulder means extending laterally beyond the hollow outer annular wall for receiving plunger means for urging the closure over the receptacle and axially over the first external bead and into mating fit on the first external bead and for urging the skirt into engagement with the second external bead,

the length of the outer annular wall and the skirt means being such that it is necessary to stretch the skirt means in the axial direction of the receptable to engage the second external bead.

3,933,266

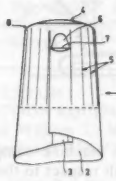
BOTTLE CAP SEAL

Bernard Dautreppe, Reims, and Michel Lallemang, Justices, both of France, assignors to Chisalu, Mareuil-sur-ay, France

Filed Nov. 24, 1972, Ser. No. 308,993

Int. Cl.[2] B65D *41/00*

U.S. Cl. 215—316 **1 Claim**



1. A bottle cap formed of a soft metal sheet having a closed upper end and a long skirt portion of frustoconical shape and having corrugations therein with the lateral edge portions overlapped for joinder, an adhesive which is hardened in between the overlapped lateral edge portions to interbond the

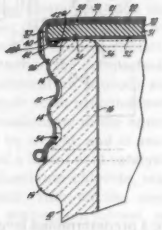
overlapped edge portions of the sheet and in which the overlapped edge portions are free of corrugations, and a single depression through the overlapped edge portions, in which the depression is formed while the adhesive is still in the unhardened state and in which the depression is located in the upper edge portion where the frustoconical skirt portion meets the top.

3,933,267

CONTAINER CLOSURE ASSEMBLY

Leroy H. Rohde, Malvern, Pa., assignor to The West Company, Phoenixville, Pa.

Filed July 16, 1973, Ser. No. 379,819
Int. Cl.[2] B65D *53/00*
U.S. Cl. 215—350 4 Claims



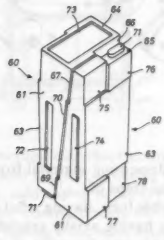
1. A container closure assembly for a container comprising an outer cap of generally cup-like form having a top and a skirt depending from the outer peripheral edge of the top, an annular pocket formed in the skirt of the cap adjacent said top, a floating liner assembly mounted in said pocket including a disc-like core of resilient material, a first liner element confronting one face of the core, a cup-like shell having a top portion overlying the other face of the core, and a turned in locking flange engageable with the first liner element adjacent the periphery thereof, and a second liner element made of a low friction material disposed between the inner surface of the top and the top portion of said shell to facilitate rotation of said shell and cap relative to one another when said members are in pressure applying relation.

3,933,268

CONTAINER

Fritz Buske, Rothenbaumchaussee 131, 2 Hamburg 13, Germany

Filed Jan. 11, 1974, Ser. No. 432,558
Claims priority, application Germany, Jan. 13, 1973, 2301645; Dec. 29, 1973, 2365193; May 24, 1973, 2326931
Int. Cl.[2] B65D *21/02*
U.S. Cl. 220—23.4 6 Claims



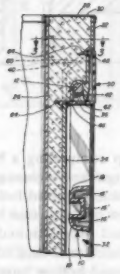
1. A container for packaging liquids adapted to interengage with an identical container to define a right parallelpiped form whereby interengaged containers interlock to restrict relative displacement therebetween comprising a hollow body having first and second spaced parallel sides of right angle trapezoid form, first and second nonparallel lateral sides, and parallel upper and lower sides, said first lateral side being perpendicular to said lower side, the spacing between said lateral sides being greater adjacent said lower side than at said upper side, first engaging means defined on said second lateral side adjacent said upper side, second engaging means defined on said second lateral side adjacent said lower side, said engaging means including surfaces transversely disposed to said second lateral side and of complimentary mating configuration, third engaging means defined on said first parallel side of trapezoid form, and fourth engaging means defined on said second parallel side of trapezoid form, said third and fourth engaging means being complimentary and interengageable for engagement with adjacent like containers.

3,933,269

HANDLE ASSEMBLY FOR CHEST

Donald Mastrovito, Shrewsbury, Mass., assignor to Family Products, Inc., Cambridge, Mass.

Filed Dec. 26, 1972, Ser. No. 317,948
Int. Cl. B65d *25/28*
U.S. Cl. 220—94 R 7 Claims



1. An improved handle construction for a container having a sidewall comprising:

means, formed integrally and in one piece with said sidewall and defining a downwardly opening channel along the exterior of the sidewall of said container, said channel generally paralleling said sidewall;

a handle having a manually grippable bottom bar, an upper hinge bar adapted to be received in said channel and means securing said bottom bar to said hinge bar in spaced relation therefrom, said hinge bar being pivotally disposed within said channel; and

a cap connected to said sidewall and adapted to cover at least a portion of the open bottom of said channel thereby to retain said hinge bar therein.

3,933,270

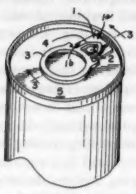
CLOSURE WITH PROTECTIVE INSERT

John S. Bozek, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,152
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 10 Claims

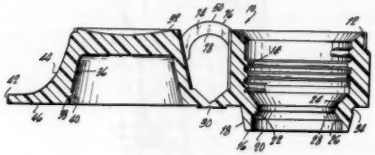
1. An improved safety closure for use on a can or similar container comprising an end panel having a score defining an

opening flap therein, a pull tab secured to said end panel and having means for fracturing said score to open said flap, and



protective means for shielding said score from said fracturing means.

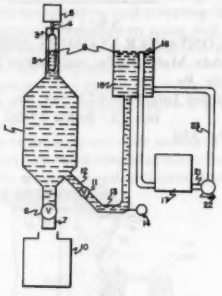
3,933,271
CAPTIVE CAP
Russell Park McGhie, Somers, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,439
Int. Cl.² B65D *43/24*
U.S. Cl. 220—335 **9 Claims**



1. A captive cap comprising a hollow base, a hollow lead tube projecting from and communicating with said hollow base, means for attaching said hollow base to a container, a cap having a hollow portion, said hollow lead tube projecting toward said cap and proportioned to reside within said cap when said cap is closed onto said hollow base, a hinge member disposed between said hollow base and said cap, at least one spring member disposed between said hollow base and said cap and spaced apart from said hinge member and with said spring member having a first end pivotally attached to said hollow base, a second end pivotally attached to said cap, and a curved portion joining said first end and said second end, said cap including a protuberance extending from the inner surface of said cap and said hollow base having a complimentary recess on its outer surface said protuberance being disposed to lodge in said complimentary recess when said cap is closed onto said hollow base for reversibly locking said cap onto said hollow base.

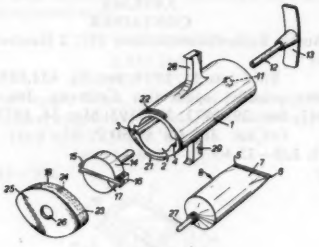
3,933,272
APPARATUS FOR DISPENSING LIQUIDS
Norman C. Lamb, Ralston, and Harvey T. Shank, Papillion, both of Nebr., assignors to Stauffer Chemical Company, Westport, Conn.
Filed Oct. 25, 1973, Ser. No. 410,008
Int. Cl.² G01F *11/28*
U.S. Cl. 222—1 **17 Claims**

14. In a method for volumetrically dispensing a predetermined weight of liquid at variable temperatures, wherein a displacement means is positioned in a calibrated vessel in a relation to the temperature of the liquid, the improvement which comprises monitoring the temperature of the liquid, positioning a displacement means in the liquid in the calibrated liquid dispensing vessel through a tubular section of reduced cross section in open communication with the main body of the vessel, the cross section of said displacement means being smaller than the cross section of the tubular section to permit passage of the liquid between the displacement means and the tubular section, wherein the position of the displacement means in the calibrated vessel is determined by the temperature of the liquid; filling the calibrated liquid



dispensing vessel to a predetermined level in the reduced cross section between the displacement means and the tubular section with the liquid whereby a predetermined weight of liquid is contained in the vessel for dispensing.

3,933,273
DISPENSER FOR EXPELLING CONTENTS OF COLLAPSIBLE TUBES AND METHOD OF USING
Patrick Clement Cox, "The Pippins", Brimpton, Reading, Berkshire, England
Filed Feb. 13, 1974, Ser. No. 442,186
Claims priority, application United Kingdom, Feb. 15, 1973, 7499/73; May 14, 1973, 22779/73; Aug. 24, 1973, 40276/73
Int. Cl.² B65D *35/30*
U.S. Cl. 222—1 **19 Claims**



1. A method of dispensing material from a collapsible tube which comprises the steps of:

placing a collapsible tube, having a flat crimped closed end, within a sleeve having axially extending grooves open at one end so as to permit insertion of, and accommodating, laterally projecting ear portions of said collapsible tube which are formed at said closed end of said tube; and

compressing said tube by an axially moving plunger also disposed within said sleeve.

3,933,274
PRODUCT FOR THE TREATMENT OF CELLULOSIC FABRICS

Stuart Albert Emmons, Cwmbran, Wales; John Leonard Metcalfe, Wirral, England, and John Winston Potts, Ndola, Zambia, assignors to Lever Brothers Company, Maine

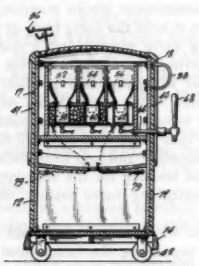
Continuation of Ser. No. 287,406, Sept. 11, 1972, abandoned. This application Oct. 9, 1973, Ser. No. 404,539
Int. Cl.² B65D 35/22; B67D 5/06
U.S. Cl. 222—94 6 Claims

1. A product comprising a container having at least two compartments for holding at least two fluid substances separate from one another but adapted for dispensing the substances simultaneously, siad container having two mutually co-extensive outer walls of flexible sheet material and at least one inner wall of flexible sheet material which is co-extensive with the outer walls and acts as a partition between adjacent separate compartments, all the walls being secured together at the edge regions of the container, such that cutting into the container along at least one edge thereof will thereby cut into all the walls and provide a multiple outlet to simultaneously dispense fluids from each of the compartments, said container having in one compartment an aqueous solution of a substituted urea-formaldehyde resin precondensate, the concentration of the resin precondensate in the aqueous solution being from about 5 to 85% by weight, and in another compartment an aqueous solution of a latent acid catalyst selected from the group consisting of aluminum chloride, magnesium sulphate, magnesium perchlorate, zinc nitrate, ammonium chloride, ammonium sulphate, ammonium nitrate, ammonium tartrate and the weak organic acids citric and tartaric acid, the concentration of the latent acid catalyst in the aquous solution being from about 1 to 40% by weight, whereby an aqueous solution containing both the resin precondensate and the latent acid catalyst in the correct predetermined proportions for their use, with the amount of the latent acid catalyst being from about 10 to 50% by weight of the resin precondensate, may readily be used for the application of crease resistant finishes to cellulosic fabrics.

3,933,275
PORTABLE WINE DISPENSER

Irving L. Metzner, Dover, N.J., and Daniel O'Connell, Pound Ridge, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,283
Int. Cl.² B67D 5/60
U.S. Cl. 222—131 6 Claims

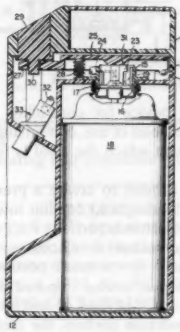


1. A portable beverage dispenser comprising a support, a housing secured to said support, a casing carried by said support in said housing, said casing being divided into a plurality of bottle receptacles, compartments for ice secured to said casing, said housing having a movable upper wall portion, said casing having a hingedly mounted wall pivotable from an upwardly extending position to a horizontal position extending outwardly of said housing, said hingedly mounted wall being supported by an ice compartment when in said horizontal position, said compartments for ice having openings disposed to communicate with the interior of said housing when said hingedly mounted wall is in said upwardly extending position and disposed to be blocked by said hingedly mounted wall when said hingedly mounted wall is in said horizontal position.

3,933,276
HEATING AND DISPENSING APPARATUS

Charles C. Packham, Wokingham; Raymond G. Parsonage, Maidenhead, both of England, and Donald L. Underwood, Holliston, Mass., assignors to The Gillette Company, Boston, Mass.

Filed Dec. 9, 1974, Ser. No. 530,992
Int. Cl.² B67D 5/62
U.S. Cl. 222—146 HE 27 Claims



1. Apparatus for heating and dispensing a product from an outlet of a pressurized container comprising:

a housing for removably receiving and holding the pressurized container;

a heat exchanger assembly mounted in said housing and spaced apart from the pressurized container, said heat exchanger assembly having an inlet and an outlet and including a cup-like mass of a heat conductive material having a wall portion, said wall portion having a single thin deep elongated passageway of a substantially uniform width and of a depth substantially equal to that of said wall portion and extending for a distance less than the circumference of said cup-like mass from said inlet to said outlet of said heat exchanger assembly;

means for directing the product from said inlet to said outlet of said heat exchanger assembly in a single predetermined direction through said elongated passageway, said directing means being positioned between said inlet and said outlet of said heat exchanger assembly thereby preventing the product from traveling through said cup-like mass a distance greater than the circumference of said cup-like mass;

manually actuable means for actuating the outlet valve of the pressurized container thereby releasing the product from the pressurized container;

means for connecting the outlet of the pressurized container to said inlet of said heat exchanger assembly;

means for connecting said outlet of said heat exchanger assembly to a delivery spout extending through said housing;

heating means disposed within said heat exchanger assembly in a heat transfer relationship with said wall portion to provide heat to the product in said elongated passageway through said wall portion; and

circuit means for connecting said heating means to a power source.

3,933,277

METHOD AND DEVICE FOR CONTROLLING FLUID PRESSURE

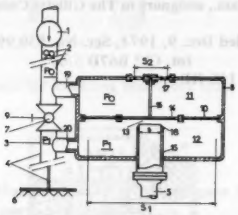
Jean-Pierre Volat, Marseille; Fernand Berthoud, and Guy Berthoud, both of Belleville-sur-Saone, all of France, assignors to Berthoud, S.A., Belleville-sur-Soane, France

Filed Aug. 12, 1974, Ser. No. 496,732

Claims priority, application France, Aug. 13, 1973, 73.29510

Int. Cl.² A01C *15/00*; L01M *6/00*

U.S. Cl. 222—178 7 Claims



1. A regulator device for controlling the pressure of a fluid delivered to a point of use, comprising:

a conduit through which the fluid is forced towards said point of use;

means in said conduit to create a pressure drop therein, said means dividing said conduit into an upstream portion and a downstream portion;

valve discharge means to discharge a fraction of said fluid from said downstream portion of said conduit;

and movable means having opposed areas responsive to the pressures of said fluid in said upstream portion and in said downstream portion, the areas of said movable means being different and being effective to actuate said valve discharge means in such manner as to maintain in said downstream portion a pressure dropped in proportion to said ratio.

3,933,278

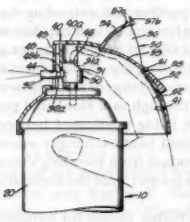
CHILD-SAFE CONTAINER ASSEMBLY

Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 23, 1974, Ser. No. 508,375

Int. Cl.² B65D *83/14*

U.S. Cl. 222—182 5 Claims



1. A child-safe container assembly comprising:

a container having closure means selectively actuable for releasing contents from said container;

cover means for said container defining an elongated passageway whose internal end communicates with said closure means and whose external end defines an aperture adapted for the insertion of a single finger of a user, the length of said passageway being such that the finger of an adult is able to reach said closure means but the finger of a young child is not long enough to do so; and

a damper-like member pivotally supported from said cover means and normally obstructing said passageway whereby the finger of the user must move said damper-like member at least partially out of the way before being able to reach and actuate said closure means.

3,933,279

AEROSOL DISPENSER FOR FLUID PRODUCTS COMPRISING A PISTON PUMP ASSEMBLY FOR GENERATING COMPRESSED AIR

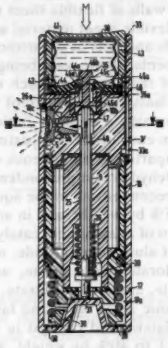
Christian Maier, Munich, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,550

Claims priority, application Sweden, Nov. 28, 1972, 15486/72

Int. Cl.² B67D *5/54*

U.S. Cl. 222—193 3 Claims



1. In an aerosol dispenser for fluid products comprising a container for product to be dispensed, a piston-cylinder pump means separate from the product container, and having piston and cylinder means, one of which is movable relative to the other which is fixed, for generating compressed air as a propellant, spray nozzle in which compressed air flowing therethrough aspirates, and sprays product from the product container, flowpaths, for compressed air from the pump means, and for product from the product container, to the spray nozzle, valve means comprising valve housing and displaceable valve bodies in the housing, and being associated with said flowpaths and opening the paths dependent on the movable means of said pump means approaching or reaching full compression stroke position in the fixed means of the aforesaid pump means, abutment means in the pump means acting, in the aforesaid compression stroke position, by direct mechanical contact on at least the valve body of the compressed air flow-controlling valve means; and a mounting for said spray nozzle and having a passageway therein which is part of said compressed-air flowpath; said product container and product flow control valve means being mounted on said mounting and said mounting being detachably connected to the fixed means of said piston and cylinder means, forming a mounting-piston assembly; and said fixed means being hollow and constituting the housing for the remaining parts of said compressed air controlling valve means; the improvement comprising

a. flexible elastic wall means across said compressed air flowpath and separating the latter from the interior of said product container;

b. product outlet means in the wall of said product container outside said flexible elastic wall means and being part of said flowpath for product to said spray nozzle; and

c. a movable valve member mounted on said flexible elastic wall means and biased toward the closed position and having abutting means in an open end of said passageway in said mounting, and said valve body of said compressed air flow-controlling valve means having contact rod means extending through said passageway and engaging said abutting means of said product flow control valve means and thereby opening the product flowpath, when

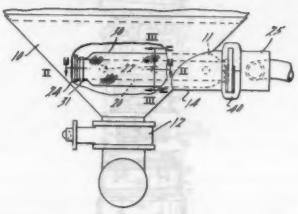
said abutment means in the piston pump acts on the valve body of said compressed air flow-controlling valve means.

3,933,280

BULK CARGO UNLOADER AERATOR

Rex V. Plumb, Hopwood, Pa., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Apr. 11, 1974, Ser. No. 459,887
Int. Cl.² B67D *5/54*
U.S. Cl. 222—193 **1 Claim**



1. In combination with a hopper having a side wall with an orifice-defining portion in said wall between the top and bottom thereof, an aerating assembly comprising a rigid pervious elongated tubular supporting member and a loose porous fabric enclosing sleeve secured thereover, a hollow neck carried by said orificed portion of the wall and projecting laterally outwardly from the hopper, the aerating assembly having a cross sectional area which is materially less than that of the interior of the neck and also materially less than that of the orifice defined by said portion and being insertable into the hopper, and removable from the hopper, through said neck and orifice, coupling clamp means appurtenant to said neck which when released frees said aerating assembly for removal from said neck, said assembly being in a generally horizontal position and extending into and through said neck and orifice and across the hopper, with an air inlet portion of said assembly connectible through said neck and coupling to an external air supply, a portion of said sleeve being inside the neck when the aerating assembly is secured in said position, whereby air may be discharged into the neck as well as into a cross section of the hopper to prevent clogging in either area, and whereby air is also directed laterally into the hopper from the neck.

3,933,281

APPARATUS FOR VIBRATING BULK MATERIAL WITHIN A BIN OR TANK

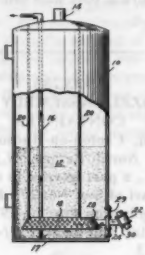
Samil S. Uralli, Palos Verdes, and Lemuel Huff, Paramount, both of Calif., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 110,941, Jan. 29, 1971. This application July 9, 1973, Ser. No. 377,682
Int. Cl.² B65G *65/70*
U.S. Cl. 222—200 **5 Claims**

1. An apparatus for vibrating powdery bulk material in a container for aiding flow therefrom, said apparatus comprising:

a. a container closed at its bottom and having inlet means and outlet means for transiently storing powdery bulk material, said outlet means including a material suction conveyance pipe;

b. a closed-loop shaped vibratable member defining a substantially centrally located opening therethrough, said member being positioned within said container near the closed bottom of the container and in a non-contacting relationship therewith, said vibratable member being positioned substantially parallel with a horizontal plane passing through said container and including an outer periphery and inner periphery, both of which are angularly disposed with respect to said horizontal plane, said conveyance pipe extending into said container and terminating between said vibratable member and the closed bottom of said container, said opening defined by said member being exposed to the material in said container



so as to allow material in said container to pass through said opening;

c. means for supporting said vibratable member within said container; and

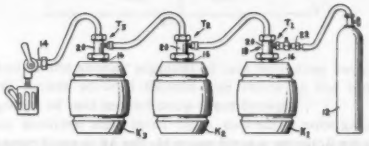
d. means for vibrating said vibratable member.

3,933,282

UNIVERSAL TAVERN UNIT FOR KEG TAPPING DEVICE

Frederick F. Stevens, Jr., Fairfield, Conn., assignor to Hoff-Stevens, Inc., Ansonia, Conn.

Filed Feb. 4, 1974, Ser. No. 439,540
Int. Cl.² B65D *83/00*
U.S. Cl. 222—400.7 **6 Claims**



1. In a keg tapping apparatus having a keg unit for connection to a keg, the improvement comprising a universal tavern unit having a body for connection to the keg unit and including means defining fluid passageways through said body for communicating with the interior of the keg when the keg unit is connected to the keg and the tavern unit is connected to the keg unit, a cylindrical tubular part connected to the body and extending outwardly therefrom, said cylindrical tubular part partially defining one of said fluid passageways and having a generally radially disposed axially outwardly facing annular bearing surface thereon, a pressure relief-check valve adaptor assembly including a first tubular part having a radially disposed axially inwardly facing sealing surface, a male thread on one of said parts comprising said cylindrical part and said first tubular part and a female thread on the other of said parts for threadable engagement with said male thread for releasably connecting said first tubular part to said cylindrical part, a pressure relief valve mounted on said first tubular part intermediate its ends and communicating with the interior thereof, said pressure relief valve extending radially outwardly from said first tubular part, a second tubular part, means for releasably connecting said second tubular part to said first tubular part, an elastomeric check valve disposed in one of said first and second tubular parts and having means associated therewith for cooperating with said first and second tubular parts to provide a substantially fluid tight seal between said first and second tubular parts when the latter parts are connected, and at least one annular sealing and positioning washer selected from a plurality of washers of differing axial thicknesses, said

one washer disposed between said cylindrical part and said first tubular part in sealing engagement with said bearing surface and said sealing surface, said one washer causing said pressure relief valve to attain a generally predetermined angular position relative to said body when a generally predetermined torque is applied to threadably connect said first tubular part to said cylindrical part with said one washer therebetween.

3,933,283

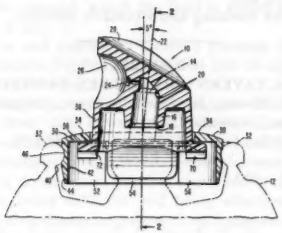
ACTUATOR NOZZLE ASSEMBLY FOR AEROSOL CONTAINERS

Harold G. Hoagland, Croton-on-Hudson, N.Y., assignor to Elmer Hoagland, North Bergen, N.J. and Curtis Ailes, Mount Kisco, N.Y., a part interest to each

Continuation-in-part of Ser. No. 274,195, July 24, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,697

Int. Cl.² B65D *83/14*

U.S. Cl. 222—402.13 **18 Claims**



1. An actuator nozzle assembly for an aerosol container of the type having a tubular valve stem protruding at the center of one axial end thereof, comprising

an actuator which is rotatable with respect to the valve stem when assembled therewith,

said actuator comprising a member defining a cylinder surface operable to telescopically interfit with the valve stem and forming a seal therewith,

said actuator including a nozzle opening communicating with the interior of said cylinder surface member and extending radially outwardly from the upper end thereof,

said actuator also including a skirt portion extending downwardly and generally parallel to the axis of said cylinder surface member and having radially outwardly extending flange at the lower portion thereof,

the upper surface of said flange generally defining a plane,

a locking ring arranged for assembly to the upper edge portion of the aerosol container,

said locking ring having a radially inwardly extending flange portion which interlocks with the upper surface of said radially outwardly extending flange of said skirt portion of said actuator,

said plane defined by said upper surface of said radially outwardly extending flange of said skirt portion being tilted away from an orientation perpendicular to the axis of said cylinder surface member so as to impart a corresponding tilt to said actuator and the associated valve stem in the assembled 'at rest' position,

the tilt of said flange being downwardly in the front of said nozzle opening and upwardly in the rear of said nozzle opening.

3,933,284

SECURITY BOTTLE CLOSURE DEVICE

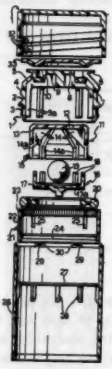
Piergiacomo Guala, Alessandria, Italy, assignor to S.A.S. Angelo Guala di Piergiacomo e Roberto Guala & C., Alessandria, Italy

Filed Oct. 2, 1974, Ser. No. 511,395

Claims priority, application Italy, Oct. 17, 1973, 70068/73

Int. Cl.² B65D *5/76*

U.S. Cl. 222—500 **2 Claims**



1. A security closure device for attaching to the neck of a bottle which has an annular groove in the neck, comprising:

a. a pourer body, having an annular groove therein,

b. a plurality of radially inwardly protruding ribs located within said pourer body, the innermost edges of said ribs being downwardly divergent when said bottle is in an upright position,

c. a valve seat,

d. a shutter disc valve which is axially slidable within said pourer body, said disc valve movable between a closed position wherein it abuts said valve seat, and an open position spaced from said valve seat,

e. a ball interposed between said shutter disc valve and said radially inwardly protruding ribs, the weight of said ball holding said shutter disc valve in its closed position when the axis of the bottle is vertical or horizontal and allowing the shutter disc valve to open when the axis is tilted past a horizontal position,

f. an annular collar attachable to said pourer body, said annular collar having a first inner annular projection for engagement with the annular groove in the bottle neck and a second inner annular projection for engagement with the annular groove in said pourer body, said second annular projection and said annular groove in said pourer body being knurled to prevent relative rotation between said annular collar and said pourer body,

g. an outer sleeve surrounding said annular collar,

h. a cap threadingly engaged with said pourer body, and

i. a plurality of frangible links connecting said cap to said outer sleeve.

3,933,285

ELECTROSTATIC PAINT SPRAYING SYSTEM WITH PAINT LINE VOLTAGE BLOCK

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.

Filed Dec. 3, 1973, Ser. No. 421,504

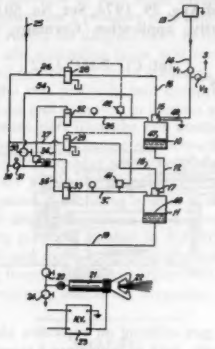
Int. Cl.² B67D *5/08*

U.S. Cl. 222—56 **7 Claims**

4. The system of claim **3**, further characterized by

a. said discharge means including a rotating plate-like member positioned within said vessel,

b. said plate-like member being spaced above the maximum liquid level in said vessel and below the upper wall thereof, and



c. said discharge means further including means for controllably flowing coating material into said plate-like member.

3,933,286

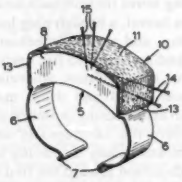
PIN CUSHION AND METHOD OF MAKING SAME

Esko Kullerno Karkas, 22 Howland Road, Toronto, Ontario, Canada (M4K 226)

Filed Jan. 29, 1974, Ser. No. 437,711

Int. Cl.² A44C *5/00*

U.S. Cl. 224—28 P **1 Claim**



1. A pin cushion comprising a holder constituted by a unitary piece of thermoplastics material in the form of an arcuate wrist-covering band having its ends bent into flexible arcuate jaws adapted to engage around the wrist of the user, and having side walls extending along opposing side edges of the central arcuate portion of the band, and extending upwardly from said band and defining an open-ended channel therebetween and cushion material snugly received and secured in the channel between the side walls, the cushion material being of a shape complementary to said channel and composed of fibrous felt arranged with its fibers running in a direction substantially normal to the band and the surface of said material being directly exposed at the top and ends of said channel.

3,933,287

BOOK STRAP

Gerard Foley, P.O. Box 1191, New Rochelle, N.Y. 10802

Continuation-in-part of Ser. No. 439,240, Feb. 4, 1974, Pat. No. 3,865,292. This application Oct. 31, 1974, Ser. No. 519,596

Int. Cl.² B65D *71/00*

U.S. Cl. 224—55 **4 Claims**

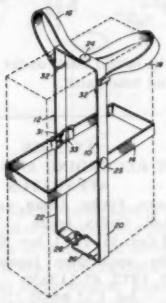
1. A device for carrying a package comprising:

a first strap, a second strap and a third strap, each of said straps being formed from an elastic material;

means securing said first and second straps to each other at a common location between the ends of each of said straps to define a short segment and a long segment of each strap;

said first and second straps extending along substantially the same direction, said long segment of said first strap having an end which extends outwardly from said common location beyond the adjacent end of the short segment of said second strap, the opposite end of the long segment of said second strap extending beyond the corresponding opposite end of the short segment of said first strap;

a loop means secured to the shorter segment of said second strap and receiving the longer segment of said first strap therethrough;



the end of the shorter segment of said first strap having a loop means secured thereto and receiving the longer segment of said second strap therethrough;

means securing said third strap extending substantially transverse to said first and second straps to said first strap at a point intermediate said first common location and the end of the longer segment of the first strap; and

fastener means secured to the outermost end of each of the longer segments of said first and second straps and to each of the ends of the third strap to enable said straps to be wrapped about said package with the outermost end of each of the longer segments of said first and second straps interconnected and the ends of the third strap separately interconnected.

3,933,288

DISPENSING CARTON WITH CUTTING EDGE

Glenn E. Struble, Oxford, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,330

Int. Cl.² B26F *3/02*

U.S. Cl. 225—49 **6 Claims**

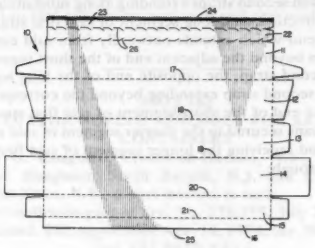
1. A carton for dispensing sheet material formed from a blank of paperboard material or the like comprising

a front wall panel, a top wall panel, a rear wall panel, a base panel, and an overlap panel connected in the aforementioned consecutive order,

a tear strip connected to said front wall panel along the opposite side from the connection of said front wall panel to said top wall panel,

a cutter strip connected to said tear strip on the opposite side of said tear strip from the connection of said tear strip to said front wall panel,

a cutting edge on said cutter strip on the free end of said cutter strip opposite to its connection to said tear strip,



said cutter strip folded back under said tear strip and attached to said base panel.

3,933,289

MAGNETIC RECORDING AND REPRODUCING APPARATUS

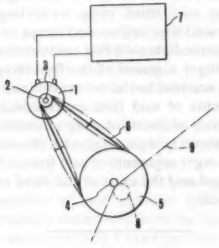
Mitsuaki Furukawa, Fuchu, Japan, assignor to New Nippon Electric Co., Ltd., Osaka, Japan

Filed Oct. 31, 1973, Ser. No. 411,331

Claims priority, application Japan, Nov. 7, 1972, 47-111482; Nov. 13, 1972, 47-113630

Int. Cl.² B65H 17/22

U.S. Cl. 226—178 **8 Claims**



1. In magnetic recording and reproducing apparatus of the class comprising a driving motor, and a capstan driven by said driving motor for driving a record/read out tape and wherein the speed of said tape is varied over a wide range including very low speeds of the order of 1.8 millimeters per second, the improvement wherein said driving motor comprises a pulse actuated stepping motor having a drive shaft, variable frequency pulse control means coupled to and exciting said pulse actuated stepping motor for varying the frequency of the excitation pulses applied to said pulse actuated stepping motor to thereby vary the speed at which the tape is driven, and resilient belt coupling means coupling said stepping motor to said capstan for transforming intermittent rotation of said stepping motor drive shaft into substantially uniform rotation of said capstan.

3,933,290

EXPLOSION-DRIVEN BOLT SETTING GUN WITH DRUM MAGAZINE

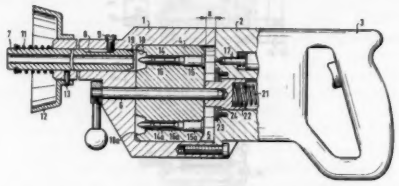
Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Aug. 29, 1974, Ser. No. 501,833

Claims priority, application Germany, Sept. 6, 1973, 2345054

Int. Cl.² B25C 1/12

U.S. Cl. 227—9 **7 Claims**



1. A setting gun utilizing an explosive charge for driving fastening elements, such as bolts, into a target material, comprising an axially extending housing having a first end facing in the direction in which fastening elements are driven and a second end spaced from the first end facing the opposite direction, a barrel axially movably mounted within said housing at the first end thereof, said barrel having a first end facing in the direction in which fastening elements are driven and a second end spaced from the first end thereof and facing in the opposite direction, said housing forming an axially extending space located intermediate the second end of said barrel and the second end of said housing, said space in said housing having a forward end and a rearward end spaced axially from the forward end and located further away from the first end of said housings, a rotatable drum magazine positioned within said space in said housing with its axis of rotation disposed in parallel relation with the axis of the housing and having a number of receiving bores therein each arranged to be aligned with the axis of the barrel, a breech plug located at the second end of said housing, and a firing mechanism located within said breech plug and arranged to fire cartridges positioned in the receiving bores in said drum, wherein the improvement comprises that said barrel and drum magazine are axially displaceable within said housing between a firing position and a rest position where the cartridges in said drum magazine cannot be fired, means axially displacing said barrel and said drum in the axial direction toward the first end of said housing into the rest position so that displacement of said barrel and drum magazine toward the second end of said housing against the action of said means is required for positioning said barrel and drum magazine in the firing position, said drum magazine having a forward end and a rearwad end spaced axially from the forward end and located closer to the second end of said housing, said means comprising a first means for spring biasing said barrel into the rest position and a second means for spring biasing said drum magazine into the rest position, in the rest position the forward end of said drum magazine is located spaced axially rearwardly from the second end of said barrel, said firing mechanism comprising a firing pin located entirely in said breech plug and arranged to fire a cartridge in said drum magazine when said drum magazine is moved into the firing position, said first means comprising a first spring biasing said barrel so that the second end of said barrel in the rest position is spaced axially forwardly of the forward end of said space containing said drum magazine, said second means comprises a force storage device mounted in said breech plug and disposed in contact with the rearward end of said drum magazine, said force storage device includes a compression spring for biasing said drum magazine toward the first end of said housing, said breech plug forms a closure at the second end of said housing extending across the end of the space in said housing containing said drum magazine and forming the

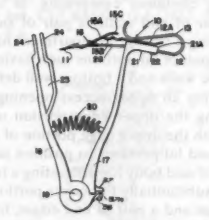
rearward end of the space in said housing, said breech plug having a recess in the surface thereof forming the rearward end of the space in said housing and the recess being aligned with the axis of rotation of said drum magazine, said force storage device comprises a pressure part axially telescopically mounted in said recess for displacement in the axial direction of said housing and extending from said recess into contact with the rearward end of said drum magazine when said drum magazine is in the rest position, said compression spring located in said recess and disposed in contact with the opposite end of said pressure part from the end contacting said drum magazine for biasing the pressure part toward the first end of said housing and into contact with said drum magazine, and said pressure part being displaceable rearwardly into said pressure plug against the biasing action of said compression spring when said drum magazine is moved from the rest position to the firing position so that in the firing position the rearward end of said drum magazine contacts the surface of said breech plug forming the rearward end of the space within said housing containing said drum magazine.

3,933,291

EAR TAG INSERTING PLIERS

Robert Edgar Stephenson, Box 16, Cayley, Alberta, Canada

Filed Apr. 29, 1974, Ser. No. 464,748
Claims priority, application Canada, Nov. 8, 1973, 185720
Int. Cl.² B25C *1/00*
U.S. Cl. 227—67 **9 Claims**



1. An applicator holder for facilitating the insertion of ear tags through ears of animals in conjunction with an applicator which includes a handle portion, an ear piercing spear on said handle portion and means on said spear to detachably hold one end of a flexible identification tag during insertion; said holder including a first jaw portion, means on one end of said first jaw portion to detachably retain said applicator, a second jaw portion, ear receiving means on one end of said second jaw portion to detachably receive the ear of the animal, means for rotationally connecting said first jaw portion to said second jaw portion at a location spaced from the respective said one ends thereof, for relative approaching movement between said one first ends of said jaw portions, and spring means extending between and normally biassing said one ends of said first and second jaw portions apart, whereby when said one end of said jaw portions are moved toward one another against the pressure of said spring means the spear of said applicator will pierce the ear of the animal and extend through said ear receiving means on said one end of said second jaw portion.

3,933,292

APPARATUS FOR WELDING

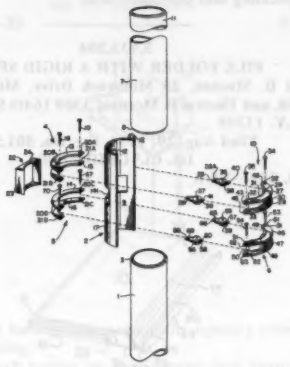
Marion A. Martin, 2055 Woodcrest, Baton Rouge, La. 70814

Filed Feb. 24, 1975, Ser. No. 552,279
Int. Cl.² B23K *37/04*
U.S. Cl. 228—49 **13 Claims**

1. An apparatus for holding a first and second objects adjacent to one another in position for welding which comprises:

a. a jacket that fits at least partially about said objects as they are positioned for welding, said jacket being provided with a welding opening through which said objects can be at least partially welded together;

b. a first securing assembly, capable of being shortened, attached to said jacket and extending around said first object in a position to secure said first object to said jacket when said first securing assembly is shortened; and



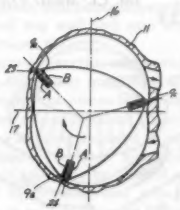
c. a second securing assembly, capable of being shortened, attached to said jacket and extending around said second object in a position to secure said second object to said jacket when said second securing assembly is shortened, said second object being secured adjacent to said first object whereby at least a portion of that area to be welded is accessible through said welding opening.

3,933,293

METHOD OF MAKING COMPOSITE METAL SEALS FOR USE IN ROTARY INTERNAL COMBUSTION ENGINES

Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 347,153, April 2, 1973, abandoned. This application May 13, 1974, Ser. No. 469,249
Int. Cl.² B23K *21/00*
U.S. Cl. 228—117 **5 Claims**



1. A method for the preparation of improved tip seals for use in rotary internal combustion engines of the type having a hollow epitrochoidal chamber enclosed by a wall and a rotor having a plurality of apexes, the rotor being rotatably and eccentrically mounted within the chamber, with the rotor having sealing means located at each apex, comprising:

A. providing at least two metal strips of different composition and frictional properties, one strip being of a high strength low friction copper base alloy;

B. cleaning the surfaces of the strips;

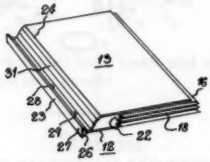
C. arranging the strips in a stack with the adjoining faces being cleaned;

D. bonding the strips together by pressure rolling;
E. subdividing and forming the strip to a composite seal having a leading and trailing face, said seal being adapted for mounting in said rotor apexes so that in use each face thereof sequentially contacts said wall, with the leading face being of the said high strength low friction copper base alloy; and
F. annealing said composite seal.

3,933,294
FILE FOLDER WITH A RIGID SPINE

Vincent D. Meenan, 25 Millbrook Drive, Middletown, N.J. 07748, and Thomas P. Meenan, 3309 164th St., Flushing, L. I., N.Y. 11358

Filed Aug. 29, 1974, Ser. No. 501,546
Int. Cl.² G65D *27/00*
U.S. Cl. 229—1.5 R **3 Claims**

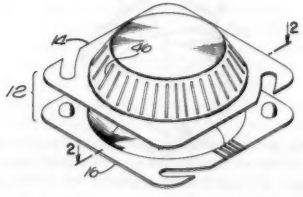


1. A file folder formed from a single, flat sheet having a front leaf and a back leaf and a pocket in the back leaf, characterized by means at a juncture of the front and back leaves for forming a rigid index spine along said juncture, said means including a flat surface along said juncture forming said spine for placement of indexing information on said flat surface, said index spine being triangular in cross section and in which said flat surface faces outward, and said means also including a short portion of said front leaf along said juncture adhesively secured thereto to provide a reinforcing leg for said rigid index spine.

3,933,295
INSULATIVE PACKAGING DEVICE

Wayne L. Congleton, Whittier, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.

Filed Jan. 17, 1974, Ser. No. 434,466
Int. Cl.² B65D *43/02*
U.S. Cl. 229—2.5 **10 Claims**

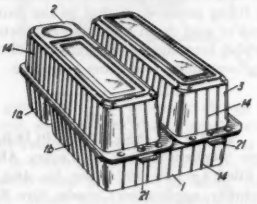


1. A packaging device comprising a pair of members which, when interconnected, form a substantially closed food container, each of said members being formed from thermally insulative foam material whereby to provide a thermally insulative structure for minimizing loss of interior heat from a hot food item, each of said members comprising a dish-shaped portion having a planar flange formed along the periphery thereof, the interior surface of said dish-shaped portion being textured to define a plurality of protuberances interconnected in a gridlike network by a plurality of valleys so as to enable moisture condensed from hot food placed adjacent said interior surface to accumulate in said valleys, the top surface of each protuberance having an area of less than 0.17 cm².

3,933,296
PACKAGING CONTAINERS

Bryan Ernest Sydney Ruskin, St. Albans, and Peter James Webber, Leverstock Green, both of England, assignors to Lunch Locker Systems Limited, St. Albans, England

Filed Mar. 5, 1974, Ser. No. 448,183
Claims priority, application United Kingdom, Mar. 9, 1973, 11453/73; Apr. 14, 1973, 18071/73; Apr. 25, 1973, 19572/73; May 9, 1973, 22135/73; Nov. 24, 1973, 54641/73
Int. Cl.² B65D *1/00, 43/10*
U.S. Cl. 229—2.5 **6 Claims**



1. A packaging container comprising, in combination, a body having a pair of end walls, a pair of side walls and a bottom wall defining a storage compartment having an upper access opening, a pair of lid portions each having a pair of end walls, a pair of side walls and a bottom wall defining a storage compartment having an upper access opening, hinge means for interconnecting the upper edge portion of each of said body side walls with the upper edge portion of one of the side walls of each of said lid portions to position said lid portions on opposite sides of said body for presenting a tray-like configuration, a pair of substantially flat cover portions each having a pair of side edges and a pair of end edges, hinge means for interconnecting the upper edge portion of the other side wall on each of said lid portions with one of the side edges on each of said cover portions each of said cover portions being pivotably movable into closing relationship with the access opening of the storage compartment of the associated lid portion, said closed lid portions being subsequently pivotably movable into vertically stacked relationship with said body to position said cover portions in adjacent closing relationship with the access opening of said body storage compartment, and releasable locking means on the upper edge portions of said body, said lid portions, and said cover portions for retaining said body and said lid portions in said vertically stacked relationship.

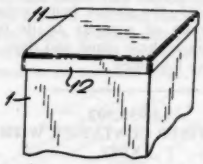
3,933,297
PACKING CONTAINER

Lars C. Carlsson, Staffanstorp; Goran K. Larsson, Dalby; Jan F. Palsson, and Hans A. Rausing, both of Lund, all of Sweden, assignors to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Feb. 11, 1974, Ser. No. 441,219
Claims priority, application Sweden, Feb. 20, 1973, 7302411
Int. Cl.² B65D *5/40, 5/56, 25/14*
U.S. Cl. 229—3.1 **4 Claims**

1. A packing container comprising a rectangular container body open at opposed ends and composed of a packaging material having coatings of a homogeneous plastic material on both sides thereof, closure panel members for closing the open ends of said container body and composed of foamed polystyrene having a thickness of from 0.5 to 2 mm. and having coatings of a homogeneous plastic material on both sides thereof and of a thickness not greater than 0.2 mm., the mar-

ginal edge portions of said closure panel members being secured to the end edges of said container body by a thermoplastic bonding agent, at least one of said marginal edge portions and the end edges of said container body being compressed together, said closure panel members including a downwardly



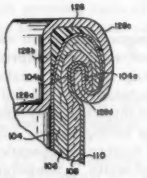
extending skirt portion around at least a portion of said closure panel members, said skirt portions being sealed to the outer wall of said container body, the walls of said container body normally flexing inwardly when the container is empty but assuming a vertical position when the container is filled.

3,933,298

END SEAM CONSTRUCTION FOR COMPOSITE CONTAINERS

Donald H. Ellerbrock, Florissant, and John E. Bacon, St. Charles, both of Mo., assignors to Boise Cascade Corporation, Boise, Idaho

Division of Ser. No. 442,399, Feb. 14, 1974. This application Feb. 26, 1975, Ser. No. 553,138
Int. Cl.² B65D *3/14, 3/22, 3/10*
U.S. Cl. 229—5.6 **3 Claims**



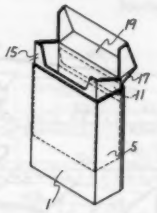
1. An end seam connection for connecting the metal end and laminated body wall members of a cylindrical composite container, said metal end member including a central end wall portion, a tubular chuck wall portion connected at one end with and extending axially from the outer periphery of said end wall portion, an annular seaming panel portion connected at its inner periphery with the other end of said chuck wall portion, and a generally tubular inwardly-facing curl portion connected at one end with the outer periphery of said seaming panel portion and arranged in concentrically spaced relation about said chuck wall portion, said body wall member including a tubular layer formed of fibrous material, and a tubular metal inner liner layer bonded to the inner wall surface of said fibrous layer and projecting axially at at least one end a given distance beyond the outer periphery of said fibrous layer, said body wall member at said one end being deformed radially outwardly to define a funnel-shaped flange portion about the outer surface of which the projecting metal liner layer is deformed, said metal end member being seated in closed relation on said flange portion of said body wall member with the central end wall portion being contained within the body wall member, said seaming panel and curl portions being connected with said flange portion by a rolled, radially-inwardly compressed seam, the reversely deformed projecting liner portion being in metal-to-metal engagement with the surface of said curl portion that faces said seaming panel portion, and a layer of sealing compound compressed solely between said metal-lined flange portion and the chuck wall and seaming panel portions of said metal end member.

3,933,299

BACKWARD OPENABLE CONTAINER WITH A DEVICE TO PREVENT ITS INNER TRAY FROM BEING SLIPPED DOWNWARD

Katsuji Shimada, 11-10, Midorigaoka, Ashiya, and Katsuyuki Shimada, 13-46-203, 2-chome, Nigawa-kita, Takarazuka, both of Japan

Filed July 5, 1974, Ser. No. 485,866
Int. Cl.² B65D *5/66*
U.S. Cl. 229—20 **3 Claims**



1. A carton having an automatically opening cover, said carton comprising:

an outer shell having an unapertured shell bottom wall which extends the full length of said outer shell;

an extension attached to the upper portion of said shell bottom wall of said outer shell and bent downwardly along an inside surface thereof;

an inner tray slidably disposed inside said outer shell and having a tray bottom wall and a tray top wall disposed parallel to one another and connected by a tray lower end wall, and an upper portion hinged to said tray bottom wall defining a lid wall having a flap extending from a rear portion thereof downwardly between said tray bottom wall and said shell bottom wall, said flap having a free lower end;

said tray bottom wall of said inner tray having a first cutout defining an upwardly directed tongue pointing towards and overlapping said free lower end of said flap;

said flap having a second cutout and forming a hook, the latter being folded and pointing in an upward direction of said upper portion of said inner tray and engagingly overlapping said downwardly bent extension of said outer shell;

said outer shell having a shell top wall, said shell top wall and said shell bottom wall being disposed parallel to one another, said shell top wall and said shell bottom wall having lower portions thereof;

two continuous pieces connecting said lower portion of said shell top wall to said lower portion of said shell bottom wall, said two continuous pieces being formed with a gap in a middle of said two continuous pieces; and

said tray lower end wall being disposed adjacent said continuous pieces of said outer shell and adjacent said gap, whereby the inner tray may be pushed upwardly within said outer shell by pressing said tray lower end wall through said gap in said continuous pieces.

3,933,300

LOIN BOX WITH LOCKING COVER

Thomas B. Dempster, Sioux City, Iowa, assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Jan. 20, 1975, Ser. No. 542,194
Int. Cl.² B65D *5/22*
U.S. Cl. 229—33 **5 Claims**

1. A loin box comprising:

a bottom panel,

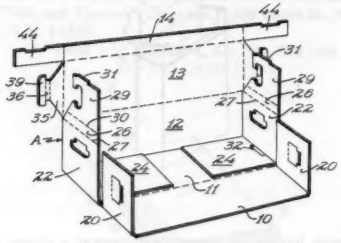
a rear wall having end walls hingedly connected to each end and extending at right angles thereto,

bottom reinforcing panels foldably connected to the lower ends of said end walls and overlying said bottom panel,

end wall reinforcing panels secured to the upper edges of said end walls, each of said end wall reinforcing panels having die-cut therein an area adjacent said rear wall including a vertically oriented elongated opening spaced a predetermined distance from said rear wall,

a front wall having intermediate end wall panels connected to the ends thereof folded between said end walls and said end wall reinforcing panels,

said end walls having hand holes therein spaced from the upper ends thereof,



a top panel hingedly connected to the upper edge of said rear wall,

a front flange connected to the forward edge of said top panel and overlying the upper portion of said front wall,

end flanges connected to the ends of said front flange and lying outwardly of the upper portions of said end walls above said hand holes, and

locking flaps on the ends of said top panel formed in shape substantially equal to said die-cut area in said end wall reinforcing panels and engageable in said hand holes to lock the top panel closed.

3,933,301

CARTON STRUCTURE AND BLANK THEREFOR

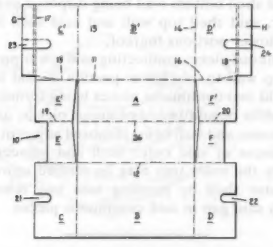
Kenneth N. Pugsley, 2164 Wedgewood Road, Mississauga, Ontario, Canada

Filed Nov. 18, 1974, Ser. No. 524,925

Claims priority, application Canada, Nov. 19, 1973, 186201

Int. Cl.² B65D *5/36*

U.S. Cl. 229—41 B **7 Claims**



1. A collapsible carton comprising a pair of opposite side panels having respective parallel bottom edges and a pair of opposite end panels having respective parallel bottom edges, the side and end panels forming a continuous wall, a base panel extending between and connected to the bottom edges of the side panels, each end panel being formed with an outwardly expressed medial fold line and defining a pair of end panel portions on opposite sides thereof, and the base panel being formed with an upwardly expressed medial fold line, the base panel and the end panels, in the collapsed condition of the carton, being folded about their respective medial fold lines so that the side panels lie superimposed with the folded base panel between them, each end panel being formed with a unitary folding flap hingedly connected to its bottom edge on opposite sides of the medial fold line and hingedly connected to the adjacent end of the base panel on opposite sides of its medial fold line, the carton being capable of being erected by application of pressure to its opposite ends whereby the end panels, base panel and flaps are unfolded about their respective fold lines.

3,933,302

CYLINDRICAL FIBER CONTAINER WITH DISPLAY LABEL

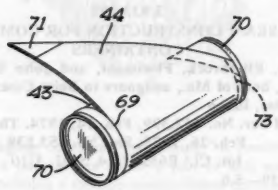
Francis R. Reid, and James R. Leezer, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 313,731, Dec. 11, 1972, abandoned.

This application Mar. 4, 1975, Ser. No. 555,208

Int. Cl.² B65D *81/34, 83/00*

U.S. Cl. 229—51 BP **10 Claims**



1. A fiber can designed to permit easy, substantially full length opening thereof, said can comprising a generally cylindrical inner body strip having a weakened separation line extending helically substantially the full length thereof from one end of the can to the other, said inner body comprising a helically wound strip having its side edges abutting one another to define said weakened separation line and said strip having an established width, a temporary reinforcing means superimposed over abutting edges of the inner body and having at least a portion thereof overlying the separation line, said reinforcing means being readily removable from the underlying can body to expose the separation line throughout substantially the entire length thereof when the can is to be opened, an overlying label formed from flexible sheet material in strip form, said label having a width of at least about 1⅛ times the established width of the strip that forms the inner body, whereby the surface area of the label is at least about 1⅛ times the outside surface area of the sidewall of the can, end closures to seal the ends of the can and a circumferentially extending collar cut is provided on the exterior of the can to a depth extending at least through the label and reinforcing means to provide a lifting tab thereon to facilitate the separate removal of the label and reinforcing means whereby the label can be removed intact and the temporary reinforcing means can be removed at a later time to expose the weakened separation line.

3,933,303

CARTON AND BLANK FOR MAKING SAME

Thomas E. Kirby, Jr., Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

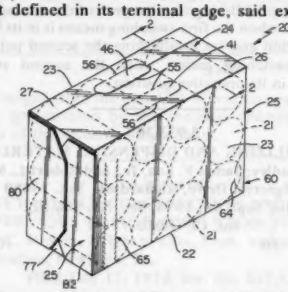
Filed Oct. 7, 1974, Ser. No. 512,460

Int. Cl.² B65D *5/46*

U.S. Cl. 229—52 B **17 Claims**

1. A carton comprising, a bottom wall, a pair of oppositely arranged side walls foldably connected to said bottom wall, and a top wall defined by a pair of flaps each foldably connected to an associated side wall, said flaps having means

defining at least a triple thickness handle for said carton, said means defining said handle comprising, one of said flaps having a first half slot defined in its terminal edge and slit means defining a first foldable tab and a first full slot, and the other of said flaps having an extension foldably connected along a weakened line, said other flap having slit means defining a second foldable tab and a second full slot and having a third full slot therein which is open and centered about an axis defined by said weakened line, said extension having a second half slot defined in its terminal edge, said extension being



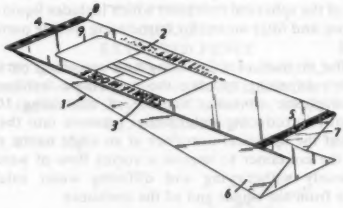
folded along said weakened line to bifold said third slot and said extension being fixed against said other flap and being dimensioned so that said half slot therein adjoins and is aligned with said second full slot to define a double thickness construction, said one flap having said first half slot being arranged so that it is aligned with said second full slot with said first full slot in said one flap being arranged in aligned relation with said bifolded third slot, said one flap being laminated against said double thickness construction to define said triple thickness handle upon severing each of said slit means and pushing the associated tab within said carton.

3,933,304

BAGS FOR CONTAINING BANK NOTES

William James Judd, London, England, assignor to Decoflex Limited, England

Filed Feb. 22, 1974, Ser. No. 444,903
Int. Cl.² B65D *33/34*
U.S. Cl. 229—62 **1 Claim**



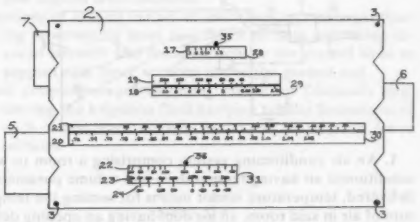
1. A container for containing slips of paper, the container comprising an elongated bag made of a synthetic plastic material, said bag having: two longitudinal end portions, each bearing an area of printing, said areas of printing extending transversely to the longitudinal axis of said bag; a first heat seal located between said area of printing at one said longitudinal end portion of said bag and the center of said bag, at a position immediately adjacent to such area of printing; and said bag being adapted to be heat sealed at a second location between said area of printing at the other said longitudinal end portion of said bag and the center of said bag, at a position immediately adjacent such area of printing; whereby after slips of paper have been inserted within the bag and the heat seal at said second location formed, any tampering with said bag would be readily visibly apparent.

3,933,305

ASSET VALUE CALCULATORS

John Michael Murphy, 104 Lehman Lane, Mill Valley, Calif. 94941.

Filed Aug. 23, 1974, Ser. No. 499,758
Int. Cl.² G06G *1/02*
U.S. Cl. 235—70 A **4 Claims**



1. A device for calculating the intrinsic, fair and proper value of certain financial assets comprising:

a body member consisting of a sleeve having a plurality of windows thereon;

a plurality of slides receivable in said sleeve;

a first index mark adjacent one of said plurality of windows;

a first logarithmic scale on one of said slides denoting a quality factor for said financial asset viewable through said one window;

a second window;

a logarithmic scale along one edge of said first slide denoting the current price of a market index viewable through said second window;

a logarithmic scale along one edge of a second slide denoting the yearly earnings of said market index viewable through said second window, said market index current price scale and said market index yearly earnings scale being juxtaposed so that values on each scale may be aligned by relative motion of said first and second slides;

a third window;

a logarithmic scale along the opposite edge of said second slide denoting the yearly earnings of said financial asset viewable through said third window;

a logarithmic scale along one edge of a third slide denoting the ratio $[(1 + \text{company factor})/(1 + \text{market factor})]^{12}$ viewable through said third window, said financial assets earning scale and said ratio scale being juxtaposed so that values on each scale may be aligned by relative motion of said second and third slides;

a fourth window;

a second index mark on said sleeve adjacent said fourth window; and

a logarithmic scale denoting the fair and proper value of said financial asset on said third slide viewable through said fourth window, whereby known values of financial asset quality factor, market index current price, market index yearly earnings, financial asset yearly earnings, and said ratio may be entered by placing said quality factor opposite said first index mark, said market index yearly earnings opposite said market index price, and said ratio opposite said financial asset yearly earnings, and the fair and proper value of said financial asset may be read out opposite said second index mark.

3,933,306
AIR INLET MEANS FOR AIR CONDITIONING INSTALLATIONS OR THE LIKE(II)

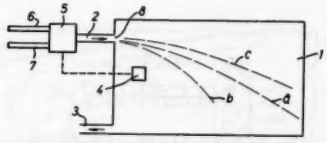
Peter Vilhelm Nielsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 356,477, May 2, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,502

Claims priority, application Germany, May 5, 1973, 2222127

Int. Cl.² F24F *7/04*

U.S. Cl. 236—49 **9 Claims**



1. An air conditioning system comprising a room to which conditioned air having temperature and volume parameters is delivered, temperature sensor means for sensing the temperature of air in said room, an air duct having an opening defined in one of said walls, air supply means responsive to said temperature sensor means for supplying a constant volume of air through said air duct having a dependent temperature which tracks said sensed temperature, damper means in said air duct for varying the effective area of said opening, regulating means responsive to said temperature sensor means for modulatingly moving said damper means for varying the air velocity in accordance with a constant value for expression $A_r l^{-3/2}$ where l represents the effective area of said opening and A_r is the Archimedean number.

3,933,307
AUTOMATIC CHOKE VALVE CONTROL ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

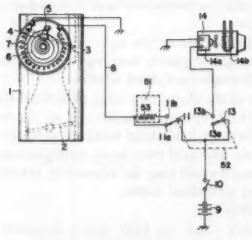
Masahiko Nakada, and Nobuyuki Kobayashi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 6, 1974, Ser. No. 476,942

Claims priority, application Japan, June 6, 1973, 48-62879

Int. Cl.² B60H *1/02*

U.S. Cl. 237—12.3 B **2 Claims**



1. For use in a water-cooled motor vehicle equipped with (A) a room heater excitable by a power source in accordance with the temperature of the vehicle engine cooling water and (B) a separate electric heater excitable by the power source for controlling a thermostat that automatically adjusts the vehicle engine choke valve, an improved automatic choke control arrangement which comprises:

first switching means for selectively connecting the power source to the room heater to effect operation of the room heater when the first switching means is moved from a first inoperative position to a second operative postion;

second switching means for connecting the power source to the thermostat heater through a selected one of a first path and a second path, the impedance of the second path being high relative to that of the first path, whereby the choke valve is opened at a relatively high rate when the second switching means establishes the first path and at a relatively low rate when the second switching means establishes the second path; and

ganging means coupling the first and second switching means for establishing the first path of the second switching means when the first switching means is in its inoperative position and for establishing the second path of the second switching means when the second switching means is in its operative position.

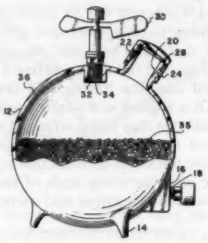
3,933,308
SOLUBILIZING AND DISPENSING MATERIAL

William S. Bradley; James F. Lea, Jr., and Robert L. Macy, all of 2216 Ridgecrest Drive, Richardson, Tex. 75080

Filed Sept. 16, 1974, Ser. No. 506,222

Int. Cl.² B05B *17/04*

U.S. Cl. 239—10 **10 Claims**



1. Apparatus for solubilizing and dispensing liquid soluble particulate material, comprising: a generally spherical hollow container; inlet means located in the lower half of the spherical container for introducing liquids into the spherical container and arranged to direct liquid flow into the container in a horizontal direction, generally tangential to the interior surface of the hollow container wall, so as to create a vortex flow of the introduced liquid; outlet means located in the top portion of the spherical container which includes liquid diffusing means; and filter means for introducing soluble particulate material.

10. The method of solubilizing and spreading particulate fertilizer comprising: placing the particulate fertilizer in a spherical plastic container capable of containing **100** psi; continually introducing water under pressure into the lower portion of the spherical container at an angle to the vertical axis of the container to impose a vortex flow of water; and continuously withdrawing and diffusing water solubilized fertilizer from the upper end of the container.

3,933,309
SPRAY BOOM

Robert J. Odegaard, R. R. 1, Box 1, Kindred, N. Dak. 58051

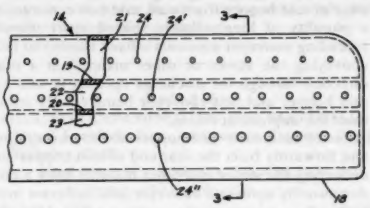
Filed Jan. 14, 1975, Ser. No. 540,896

Int. Cl.² B05B *17/02*; **B64D** *1/18*

U.S. Cl. 239—171 **30 Claims**

1. A device for spraying material into the atmosphere comprising: body means having a single wall structure surrounding a plurality of separate compartments, separate means for admitting material to each of said compartments, and means mounted on the body means for discharging material from each of said compartments to the surrounding atmosphere, said means for for discharging material including separate discharge openings in the body means, said discharge openings of one compartment being arranged with respect to the

discharge openings of a second compartment so that the discharge openings are in a staggered relationship whereby mate-



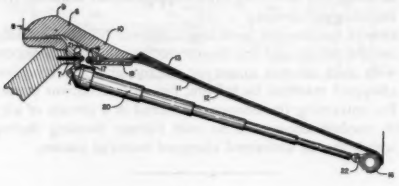
rial discharged from the openings of one compartment fall on an area not covered by the material discharged from the openings of the second compartment.

3,933,310

ROCKET NOZZLE CONSTRUCTION AND SURFACES IMPERVIOUS TO HOT, HIGH VELOCITY GASES

Charles C. Hickox, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed July 11, 1974, Ser. No. 487,521
Int. Cl.² B64D *33/04, 33/08*
U.S. Cl. 239—265.43 **10 Claims**



1. In a convergent-divergent, thrust nozzle for rockets, the improvement comprising:

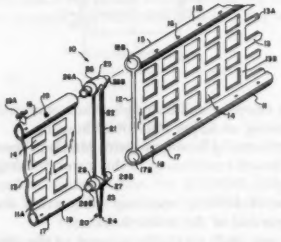
a light-weight exit cone forming at least a portion of the divergent part of the nozzle, comprising a hollow, truncated cone and densely packed, refractory fibers anchored to the truncated cone so that the fibers extend inwardly to form a pile of the inner surface of the cone.

3,933,311

EXTRUDED FENCE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 265,281, June 22, 1972. This application May 17, 1973, Ser. No. 361,049
Int. Cl.² B05B *9/00*
U.S. Cl. 239—276 **10 Claims**



1. A fence assembly comprising in combination:

a plurality of fence sections each having a central lattice-like portion,

each of said fence sections having upper and lower tubular formations integral with the central portion thereof with at least one of said tubular formations of each of said fence sections being adapted to carry an irrigation fluid, said tubular formations extending parallel to each other and longitudinally along said central portion from one end of said central portion to the other end thereof,

coupling means provided between each of said fence sections for joining said fence sections together,

said coupling means comprising respective elongated members having respective connection formations respectively secured to the ends of each of the longitudinally extending upper and lower tubular formations of respective aligned fence sections,

portions of at least certain of said coupling means protruding downwardly from said fence sections and being secured beneath said fence sections to the ground so as to support said fence sections above the ground and

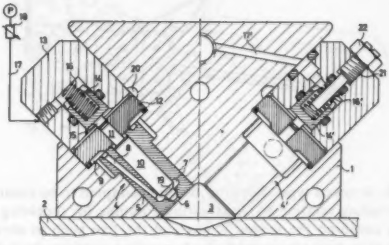
said coupling means including means for fluidically connecting the irrigation fluid carrying tubular formations of each of said fence sections to those of the adjacent fence sections.

3,933,312

GATING ARRANGEMENT FOR THE MOULDING WORKING OF PLASTICS FORMED FROM A PLURALITY OF FLUID CONSTITUENTS

Bernd Fries, Volkach, Germany, assignor to Messrs. DEMAG Kunstofftechnik GmbH, Nurnberg, Germany

Filed Apr. 23, 1974, Ser. No. 463,397
Claims priority, application Germany, Apr. 26, 1973, 2321153
Int. Cl.² B05B *12/08*
U.S. Cl. 239—413 **9 Claims**

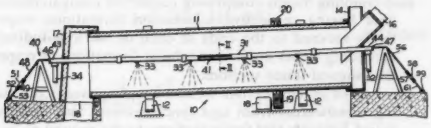


1. A gating arrangement for a plurality of fluid constituents of a plastics material comprising, a plurality of nozzles for delivering said constituents under pressure into a mixing chamber, each nozzle having a nozzle chamber, a closing element sealingly disposed within each nozzle chamber and having an end portion therein and being movable between positions opening and closing its respective nozzle, each closing element being moved, in a first direction of movement, from its closing to its opening position by pressure of said fluid constituents thereon at its end portion, and a hydraulic piston associated with each closing element and urging said closing element in a line of movement opposite to the first line of movement, means for applying hydraulic pressure to said hydraulic piston and urging said piston in its line of movement, thereby maintaining each closing element in a definite position, with respect to said nozzle chamber, on application of a predetermined hydraulic pressure to said piston.

3,933,313
SPRAY TUBING WITHIN A ROTATING DRUM SUPPORTED INDEPENDENTLY OF THE DRUM

John J. Waite, Chateauguay, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 13, 1974, Ser. No. 523,526
Int. Cl.² B05B *15/08, 1/18*
U.S. Cl. 239—587 **6 Claims**



1. In a rotary cooler device having an elongated cylindrical shell;

a tubular spray pipe extending through the elongated cylindrical shell but having no physical connection to the cylindrical shell;

a support within said tubular spray pipe and extending outwardly of the ends thereof;

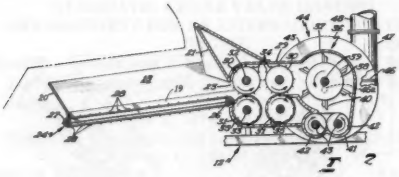
anchor means at each end of the cooler device external of the cylindrical shell; and,

means connecting the extending ends of said support to said anchor means.

3,933,314
CHOPPING IMPLEMENT

Art Luscombe, Armstrong, Iowa

Continuation of Ser. No. 331,824, Feb. 12, 1973, abandoned.
This application Sept. 3, 1974, Ser. No. 502,554
Int. Cl.² B02C *13/286*
U.S. Cl. 241—60 **1 Claim**



1. A towed type chopping machine adapted to be connected in trailing relation to a harvesting combine for receiving from the combine the leaves, stalks and the like such as stover of the crop being harvested, the harvesting combine including a housing having a downwardly facing opening of predetermined size adjacent the rear end of the combine housing, comprising:

a frame,

ground engaging wheels on said frame,

a hitch mounted on the front of said frame and projecting forwardly therefrom for connection to the rear end of a harvesting combine,

an elongate hopper mounted on said frame adjacent the front end thereof, said hopper having elongate side walls and a front end wall and having length and width dimensions slightly larger than the corresponding dimensions of the downwardly facing discharge opening of a combine housing, the front and side walls of said hopper having lower edges, the lower edge of said front wall being located above the lower edge of said side walls, said hopper being positioned below the discharge opening of a combine to receive therefrom stover or the like, such as stalks, leaves, shelled ears, and shuck, said hopper having a rearwardly facing discharge opening thereon,

a generally horizontally oriented endless belt conveyor positioned in said hopper and extending in a fore and aft direction, and projecting longitudinally beyond the lower edge of said hopper front wall, said belt conveyor having a plurality of longitudinally spaced apart transversely extending conveyor elements affixed thereto to facilitate conveying the stover or other material in a rearward direction through the discharge opening in said hopper, said hopper and belt conveyor being readily removable from the implement frame,

a deflector secured to said hopper and extending upwardly and forwardly from the rear end of said hopper and and deflecting the stover and other material from a combine downwardly upon said conveyor, said deflector including forwardly projecting side portions secured to the side walls of the hopper and having a lower edge, the latter defining the upper edge of said discharge opening,

a housing on said frame and having a forwardly facing opening therein,

a pair of vertically arranged driven feed rolls positioned in said housing closely adjacent the rear end of said conveyor and receiving the stover or similar material from the conveyor,

a driven rotary chopper device positioned in said housing rearwardly of the feed rolls to receive the stover or similar material therefrom, and being operable to chop the stover or similar material into fine particles,

a second conveyor means positioned adjacent the chopper housing and receiving the chopped stover material from the chopper device,

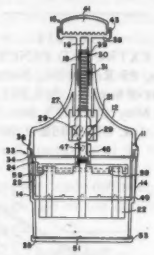
a blower mechanism including a blower housing mounted on one side of said first mentioned housing and connected with said second conveyor means and receiving said chopped mateiral therefrom, fan in said blower housing for entraining the chopped material in a stream of air,

and conduit connected to said blower housing through which the air entrained chopped material passes.

3,933,315
FOOD CHOPPER & CUTTING SURFACE

Samuel Joseph Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.

Filed July 12, 1974, Ser. No. 487,973
Int. Cl.² B02C *18/04*
U.S. Cl. 241—166 **6 Claims**



1. A food chopper and cutting surface comprising,

a body having an upper and lower housing,

said lower housing having a lower portion thereof,

a cutting board conforming to the lower housing configuration,

means for removably securing the cutting board to the lower portion of the lower surface,

a handle and shaft yieldably secured to the upper housing for riciprocation,

a cross bar secured to the lower portion of the shaft and having a plurality of slots along the bottom thereof and extending only partially upwardly into said cross bar,

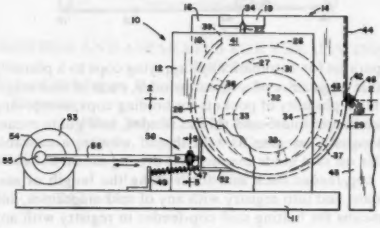
pin means passing through the cross bar and slots,
an integral convoluted blade being uninterrupted excepting only for having holes to receive said pin means, and
a stripper in said lower housing having slots conforming to the convolutions of the blade.

3,933,316

MILL FOR COMMINUTING ORE MATERIAL

Roy D. Jones, Lovelock, Nev., assignor to Resource Products, Inc., Berkeley, Calif.

Filed Mar. 21, 1974, Ser. No. 453,212
Int. Cl.² B02C *4/00*
U.S. Cl. 241—170 **19 Claims**



1. A mill for comminuting material such as mineral ores comprising the combination of a support frame, a cradle having an arcuate wall extending about a generally horizontal axis between an inlet zone and a discharge zone, at least one hollow cylindrical shell roll member supported on said arcuate wall within the cradle, the cylindrical roll member extending along a longitudinal axis disposed generally parallel with the axis of said arcuate wall, said roll member having an outer diameter less than the inner diameter of said arcuate wall whereby wedge-shaped spaces are defined therebetween, means mounting the cradle at a position on the frame for pivotal movement about a support axis which is in a vertical plane offset horizontally from the effective center of gravity of the cradle and roll member, and actuating means to move said cradle in a gyratory action through an angle about said support axis with an amplitude which is effective to cause the roll member to be lifted on one stroke and then fall back on alternate strokes within the cradle for comminuting material which is supplied through the inlet zone and into the wedge-shaped spaces.

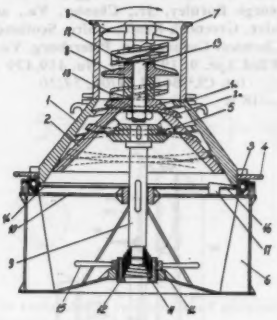
3,933,317

GRINDING MILL

Virgilio Rovere, 33010 Magnano in Riviera, via Chiesa N.4, Udine, Italy

Continuation-in-part of Ser. No. 378,080, July 11, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,623
Int. Cl.² B02C *4/10, 4/32*
U.S. Cl. 241—246 **4 Claims**

1. A grinding mill comprising two coaxial cones, means for mounting said cones in telescopic relationship so that the distance between the walls of the cones is smallest at the base of the cones, the outer cone being rotatable and having internal helical ribs and the inner cone being stationary and having external helical ribs, the ribs on one cone crossing the ribs on



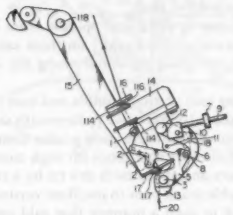
the other cone so that material passing between the two cones is conveyed from the apex to the base of the cones.

3,933,318

TENSION CONTROL APPARATUS

Toshio Yajima, Toyonaka; Terukazu Ohta, Ikeda, and Nobuhide Iwasaki, Itami, all of Japan, assignors to Kamitsu Seisakusho Ltd., Japan

Filed Apr. 8, 1974, Ser. No. 459,166
Claims priority, application Japan, Apr. 14, 1973, 48-41843
Int. Cl.² B65H *59/30*
U.S. Cl. 242—154 **4 Claims**

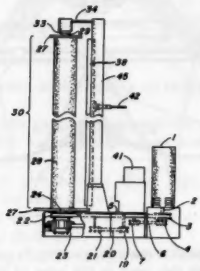


1. A yarn tension control device for controlling the tension of a running yarn comprising, first and second yarn guide members having yarn guide pins alternately engaged by traveling yarn, means mounting the first yarn guide member pivotally free to pivotably move rockably across the normal yarn path, means movably mounting the second yarn guide member, the first yarn guide member mounting a roller or pin spaced from the pivot thereof and a first balancing weight, a control cam pivotally mounted and having a second balancing weight and an extending arm, a third weight adjustably mounted on said extending arm, said control cam having a cam profile which contacts said roller or pin mounted on the first yarn guide member, and the third weight and said extending arm biasing said cam profile into engagement with said roller or pin to pivot the first yarn guide member in a desired direction.

3,933,319
VERTICAL SPINDLE WINDER

Harold Gerard Sachleben, Sr., Bellmawr, N.J.; Everett Gray Montgomery, Chester, Va.; Clarence Albert Forman; Robert David Carr, both of Hopewell, Va.; Lawrence Edward Cary, Richmond, Va.; Beryl Aaron Boggs, Chesterfield, Va.; Harold George Burnley, Jr., Chester, Va., and Alistair James Chafer, Greenock-Renfrewshire, Scotland, assignors to Allied Chemical Corporation, Petersburg, Va.

Filed Apr. 9, 1974, Ser. No. 459,429
Int. Cl.² B65H *54/06, 54/30*
U.S. Cl. 242—18 R **6 Claims**



1. In an apparatus to wind vertically running yarn comprising

a vertical spindle with a driven pulley mounted on a shaft,
a stationary yarn guide,
an upper vertically movable yarn guide,
a lower vertically movable yarn guide,
a double track cam, vertically mounted with vertically attached driven pulley and shaft,
an upper cam follower and shoe,
a lower cam follower and shoe,
a cam housing, vertically mounted and having a vertical slot,
a motor having a spindle drive pulley and a cam drive pulley mounted on a drive shaft,
connecting means to drive said spindle from said motor,
connecting means to drive said cam from said motor, and
a presser roll, vertically mounted along the length of said spindle

said motor driving said vertical spindle and cam by connection of said driven pulleys to said drive pulleys with said connecting means, said vertically movable yarn guides connected to said respective cam followers and shoes through cam housing slot, said cam followers and shoes both driven by a respective cam track of said double track cam to oscillate vertically along said cam housing slot in such a manner that said upper vertically movable yarn guide oscillates only in the upper half of said slot at half the speed of the lower vertical movable yarn guide, and the lower vertically movable yarn guide oscillates nearly the full length of said slot and for the full traverse of the winding yarn, said movable guides acting in concert to maintain a constant length of yarn between the stationary yarn guide and the spindle, said stationary guide centered with respect to said vertical spindle, said presser roll holding said wound yarn in a cylindrical package during winding, the improvement comprising

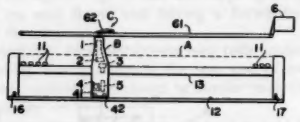
said connecting means to drive said cam including a two speed transmission to drive said cam at two winds,
said high speed double track cam having tracks cut so that said cam followers will describe a path at the reversal along a 60° angular displacement of a curve of a cycloidal development

so that said spindle and said cam can start at a wind of from about 89 to about 152.52 and after about 0.1 to about 3 minutes change to achieve a wind of about 11 to about 17 whereby said wound up yarn can be unwound at speeds up to 3,000 feet per minute.

3,933,320
APPARATUS AND PROCESS FOR AUTOMATICALLY SUPPLYING COPS TO A THREAD WINDER

Kotaro Tsurumi, Takatsuki; Shigeyuki Nishiyama, and Kunio Nishimura, both of Amagasaki, all of Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha, Japan

Filed Aug. 29, 1973, Ser. No. 392,572
Claims priority, application Japan, Aug. 30, 1972, 47-101745[U]; Sept. 4, 1972, 47-88512; Sept. 4, 1972, 47-88513; Sept. 4, 1972, 47-88514; Mar. 31, 1973, 48-37038
Int. Cl.² B65H *54/20, 54/26*
U.S. Cl. 242—35.5 R **18 Claims**

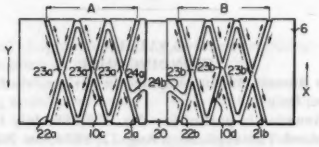


1. Apparatus for automatically supplying cops to a plurality of rotatable magazines of a thread winder, each of said magazine having a plurality of pockets for holding cops, comprising guide means proximate said thread winder, said guide means being essentially as long as said thread winder, a movable cop-feeder on said guide means, first driving means for moving said cop-feeder back and forth along the length of said guide means and into registry with any of said magazines, and halting means for halting said cop-feeder in registry with any of said magazines, said cop-feeder including a cop-storage section, a rotatable cop-holder movable between two positions, said cop-holder having at least one cavity for holding a cop, said cop-holder in the first of said positions being adapted for receiving at least one cop from said cop-storage section and in the second of said positions being adapted for transferring at least one cop to a magazine, means for feeding cops from said cop-storage section to said cop-holder, means for moving said cop-holder reciprocally between said two positions, said cop-storage section and said magazine being in spaced-apart relation, and means for transferring cops by gravity from said cop-holder to said magazine.

3,933,321
DEVICE FOR SIMULTANEOUSLY TRAVERSING THREAD GUIDES OF A WINDING APPARATUS FOR TAKING-UP PLURAL THREADS

Yoshikazu Kawauchi, and Hiroshi Honda, both of Takahama, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Tokyo, Japan

Filed Feb. 24, 1975, Ser. No. 552,659
Claims priority, application Japan, Feb. 27, 1974, 49-23461[U]
Int. Cl.² B65H *54/30*
U.S. Cl. 242—43 R **4 Claims**



1. In a winding apparatus for simultaneously taking up a plurality of threads, provided with a common friction roller for rotating a plurality of bobbins or thread packages formed on said bobbins and a traverse device disposed at a position adjacent to said friction roller, an improved traverse device

comprising a cam box provided with a horizontal aperture formed at a part thereof in parallel condition to a longitudinal axis of said friction roller, a pair of thread guide rails secured to edge portions of said horizontal aperture of said cam box in parallel condition to said aperture, at least a pair of thread guides slidably disposed in a space formed between said guide rails, a common cam rotatably held in said cam box in axially parallel condition to said aperture of said cam box; said common traverse cam provided with at least a pair of helical endless guide grooves formed on a cylindrical surface thereof and provided with a ring shaped guide groove formed on said cylindrical surface thereof at an intervened position between said helical endless guide grooves and provided with a pair of auxiliary guide grooves connecting axially inside portions of said endless guide grooves to said ring shaped guide groove, respectively, one of said guide rails provided with a cut-out portion formed at a central portion thereof facing said ring shaped guide groove, said thread guides slidably engaged in either one of said guide grooves of said common traverse cam, respectively.

3,933,322
METHOD AND APPARATUS FOR THE UNWINDING OF BANDS

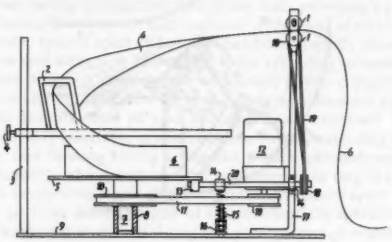
Roland Satzinger, Hammelburger Str. 21 a, 8731 Euerdorf, Germany

Filed July 31, 1974, Ser. No. 493,932

Claims priority, application Germany, Aug. 9, 1973, 2340321

Int. Cl.² B65H *75/02*

U.S. Cl. 242—55 **9 Claims**



1. A method for unwinding and simultaneously turning a band or the like from an unwinding reel on which it is wound, which reel has a vertical axis of rotation which comprises removing said band off of said reel in a horizontal direction, raising said band to a height above said reel in said horizontal direction and, at said height, turning said band about 90° and moving said band, while turned, in a direction opposite to that in which it was removed from said reel.

3,933,323
SOLID STATE SOLAR TO MICROWAVE ENERGY CONVERTER SYSTEM AND APPARATUS

Kenneth W. Dudley, Sudbury, and George H. MacMaster, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 20, 1974, Ser. No. 453,133

Int. Cl. B64c *39/02*

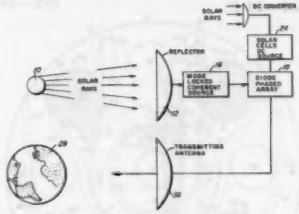
U.S. Cl. 244—1 R **6 Claims**

1. A system for converting solar energy into microwave energy comprising in combination;

a source of solar energy radiation;

means for collecting said solar energy operatively associated with a pulsed coherent radiant energy mode-locked laser beam source operative at a fixed predetermined microwave energy frequency;

solid state semiconductor amplifier means adapted to be irradiated by said radiant energy laser beam to generate an amplified microwave energy output at substantially said predetermined frequency; and



means for transmitting said amplified microwave energy to a utilization load.

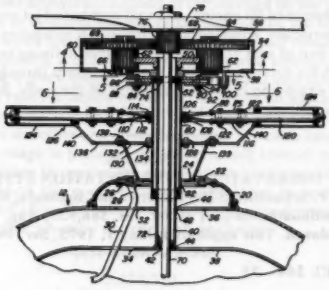
3,933,324
HELICOPTER WITH OPPOSITE ROTATING TORQUE CANCELLING HORIZONTAL PROPELLER

Stanislaw Ostrowski, Highway 40, Gusher, Utah 84030

Filed Aug. 2, 1974, Ser. No. 494,369

Int. Cl.² B64C *27/10*

U.S. Cl. 244—17.23 **7 Claims**

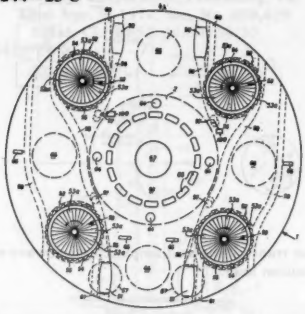


1. A helicopter including an air frame, vertically spaced and horizontally disposed small and large diameter propeller and bladed rotor assemblies, respectively, journaled from said air frame, powered drive shaft means drivingly coupled to said assemblies, said small diameter propeller being journaled from said air frame for rotation about an upstanding axis, said bladed rotor assembly including generally radial blades anchored at their radial inner ends to a hub journaled from said air frame coaxial with the axis of rotation of said propeller, said hub including flexive portions enabling vertical swinging of the outer end portions of said blades, a mounting member supported from said frame for rotation about said axis and for universal canting in all directions relative to a plane normal to said axis, and connecting means spaced about said axis interconnecting said mounting member and said blades at points on the latter spaced outwardly from said flexive portions, whereby canting said mounting member will cause the plane in which the outer end portions of said blades disposed outwardly of said flexive portions rotate to be similarly canted relative to the plane in which the propeller rotates.

3,933,325
DISC-SHAPED AEROSPACECRAFT

Joseph Richard Kaelin, Villa Seeburg, Buochs, Switzerland

Filed Sept. 24, 1974, Ser. No. 508,895
Claims priority, application Switzerland, Sept. 25, 1973, 13750/73
Int. Cl.² B64C 29/00
U.S. Cl. 244—23 C 2 Claims

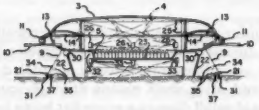


1. An aerospacecraft comprising a substantially discus-shaped body, a number of disc-type air screws provided for said body, a number of turbines and a number of jet engines provided for said body, one respective turbine and jet engine being operatively associated with a respective disc-type air screw, each of said disc-type air screws being driven by the associated turbine by means of exhaust gases emanating from the associated jet engine, each of said disc-type air screws being equipped with variable pitch blades and functioning in the manner of a helicopter rotor for the generation of lift, each turbine having vanes driven by the exhaust gases generated by the associated jet engine, and said number of jet engines being symmetrically arranged along diagonals extending across the craft, two of said number of jet engines defining rear engines, means for rotating said two rear jet engines through 180° in a plane extending through the center of the body, and each jet engine driving the associated disc-type air screw.

3,933,326
OBSERVATION/INTERPRETATION SYSTEM

Peter P. Schauffler, 5200 Battery Lane, Bethesda, Md. 20014

Continuation-in-part of Ser. No. 386,935, Aug. 9, 1973, abandoned. This application May 1, 1975, Ser. No. 573,749
Int. Cl.² B64B 1/50
U.S. Cl. 244—33 8 Claims



1. An integrated all-weather observation/interpretation system comprising:

a lighter-than-air observation vehicle for transporting passengers above a scene of interest to provide said passengers with an advantageous vantage point for the observation of said scene,

means for lifting said vehicle vertically, maintaining it at a point above the surface from which said scene can be viewed, rotating it for viewing various sectors of this scene, and returning it to the surface,

an insulated cable for continuously providing electric power to said vehicle from the surface,

a gondola under said vehicle which includes a plurality of seats facing an observation window extending from a horizontal plane substantially coincident with the passengers' normal view downward almost to a vertical plane and positioned so that said passengers can view said scene of interest therethrough,

a darkened screen positioned directly above said horizontal plane and oriented with the direction of observation so that the passengers can observe both said screen and said window,

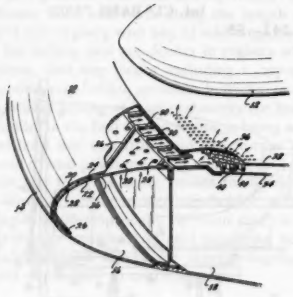
means for internally projecting supplementary and interpretive images specifically related to the scene of interest onto said screen, with said images programmed and coordinated so as to coincide with said observation, and

means for presenting audio programs coordinated with said observed scene of interest as supplemented with said images.

3,933,327
AIRCRAFT ANTI-ICING PLENUM

Leonard J. Cook, Canoga Park, and Herman A. Rosenthal, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Aug. 30, 1974, Ser. No. 502,059
Int. Cl.² B64D 15/04
U.S. Cl. 244—134 B 3 Claims



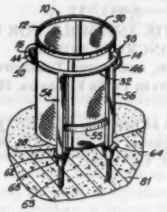
1. Anti-icing plenum to eliminate formation of ice at the leading edge of a jet engine nacelle, the nacelle being divided into leading and trailing chambers, and a partition separating said chambers, a portion of the leading and trailing chambers comprises a double skin along the side thereof generally facing interiorly toward the jet engine, said double skin defining therebetween a cell for the passage of hot gases which heat the leading chamber outer skin from the inside thereof, a series of spaced apertures formed in the inner skin of said leading chamber admit controlled amounts of hot gases into said cell, whereby said leading chamber outer skin is heated to a temperature sufficient to retard formation of ice particles at the nacelle inlet, said partition separating said chambers comprises a series of spaced channels formed between said inner and outer skins adapted to pass the spent heating gases out of said leading chamber into the trailing chamber, said inner wall of the trailing chamber comprises a structural acoustic sandwich, the intermediate layer of which comprises honeycomb cellular material, said structural acoustic sandwich comprises inner and outer skins separated by said layer of honeycomb cellular material having cells with side walls with notches therein, said side walls perpendicular to said skins, said outer skin being apertured allowing said heating gases to pass through notches cut in the side walls of the cells of said honeycomb cellular material and said apertures.

3,933,328

APPARATUS FOR RECEIVING REFUSE

Peter Werner Michelbrink, 420 Park Place, Fort Lee, N.J. 07034

Filed Oct. 25, 1974, Ser. No. 517,816
Int. Cl.² A47G 23/02
U.S. Cl. 248—146 7 Claims



1. A holder device for a refuse container, said refuse container having substantially upstanding sides providing a predetermined diameter for said container with a pair of circumferentially spaced apart closed loop handles outwardly extending from said sides with said closed loops extending substantially in the direction of said sides, said holder device comprising a circumferentially extending housing having a diameter greater than the diameter of said container, said container being removably insertable in said circumferentially extending housing, said housing having a ring-like portion circumferentially extendable about said inserted container, said ring-like portion comprising a pair of circumferentially spaced apart arcuate portions defining a pair of circumferentially spaced apart lockable openings in said ring-like portion through which said handles are insertable when said container is inserted in said housing, the circumferential spacing of said openings being dependent on the circumferential spacing between said handles, said handles of said container being simultaneously insertable through said openings and simultaneously slidably rotatable on said ring-like portion adjacent said openings when said inserted container is rotated, each of said arcuate portions comprising said ring-like portion having at least one intersecting portion extending downwardly therefrom adjacent a different one of said pair of openings for supporting said arcuate portion at a predetermined height above the ground and further comprising a pivotal locking means being disposed at a different one of said pair of openings for lockably retaining said handles to said ring-like portion to thereby prevent removal of said slidably inserted handles and thus removal of said container when said locking means locks said handles to said housing after said simultaneous slidable insertion and rotation of said handles, said pivotal locking means being pivoted to a locking position at each of said openings for locking said handles between said intersecting portions and said pivoted locking means for locking said handles to said ring-like portion while confining rotation thereon to the distance between said locked pivotal locking means and said adjacent intersecting portion, said housing further comprising anchoring means for anchoring said housing to the ground for preventing ready removal of said container locked housing, whereby the refuse container may be inserted in said holder therefor and locked in place.

3,933,329

SUPPORT APPARATUS FOR A PORTABLE SHOWER HEAD

Maurice Granger, 28 rue Charles de Gaulle, 42000 Saint Etienne - Loire, France

Filed Jan. 10, 1974, Ser. No. 432,338
Int. Cl.² A47F 5/00; A47H 1/10
U.S. Cl. 248—295 10 Claims

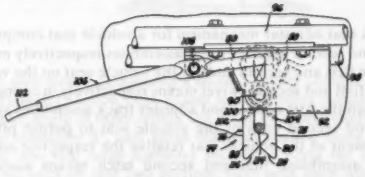
1. Adjustable support apparatus for a portable shower head, said apparatus comprising a fixable vertical guide column having a front and rear, a carriage vertically slidable on said guide column and including a support for a shower head, releasable means supporting said carriage on said guide column, and a linearly displaceable control means supported by said column and coupled to said releasable means to selectively release the same in one direction of displacement of the control means and permit descent of the carriage on the guide column and to re-effect support of the carriage by the releasable means upon release of the control means, said releasable means comprising a cable extending along said column, said cable having a given length with one end fixed to said column, at least one roller attached to said carriage and on which said cable passes, and a spring connected to said column and to said cable at the other end thereof to render the cable taut and hold the carriage in place on the column, said control means including means to oppose the action of the spring to slacken the cable when the control means is displaced in said one direction and allow the roller to travel by gravity downwards along the cable whereby the carriage descends.

3,933,330

LATCH MECHANISM

Edward S. Gwin, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 419,771, Nov. 28, 1973, Pat. No. 3,879,082. This application Oct. 15, 1974, Ser. No. 514,753
Int. Cl.² B60N 1/04
U.S. Cl. 248—371 1 Claim



1. A latch mechanism for use with a tiltable motor vehicle seat having the forward end thereof supported by a base for movement about a transverse horizontal axis, said latch mechanism comprising a plate member adapted to be secured to said base, a pair of overlapping lock members, a lock bar

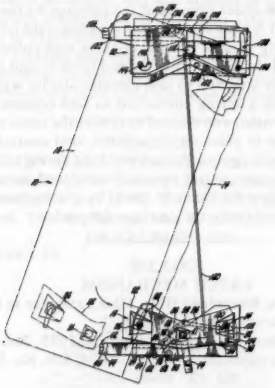
adapted to be fixed to said base for cooperation with said lock members for locking said seat to said base, pin means mounted on said plate member for pivotally interconnecting said lock members for relative movement in a scissors fashion about a first pivot axis, each of said lock members having a lower portion formed as a J-shaped hook and an upper portion having a triangular opening therein, a compression spring wound about said pin means and having a pair of oppositely extending arms which wrap around the lower portions of said lock members and urge said lower portions towards each other into a locked position with said lock bar, a release member, pivot means offset from the longitudinal axis of each of said lock members and supporting said release member on said plate member for pivotal movement about a second pivot axis that is parallel to said first pivot axis, said release member having an integral inner end formed with a pair of bends and extending into the openings formed in the upper portions of said lock members for causing the lower portions to be spread apart against the bias of said spring when said release member is pivoted about said second axis so as to place the lock members in an unlocked position relative to said lock bar, said inner end having a straight section between said pair of bends, the longitudinal center axis of said straight section being parallel to and lying in a common vertical plane with said first pivot axis when the lock members are in the locked and unlocked positions.

3,933,331

SEAT ADJUSTER MECHANISM

Hubert P. Blom, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,832
Int. Cl.² F16M *13/00*
U.S. Cl. 248—425 **2 Claims**



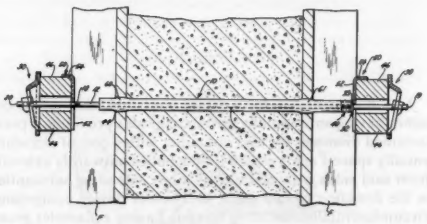
2. A seat adjuster mechanism for a vehicle seat comprising: first and second adjuster track assemblies respectively mounting the first and second ends of the vehicle seat on the vehicle body, first and second swivel means respectively in connection between the first and second adjuster track assemblies and the first and second ends of the vehicle seat to permit pivoting movement of the vehicle seat relative the respective adjuster track assemblies, first and second latch means associated respectively with the first and second adjuster track assemblies, and being movable between latched and unlatched positions to permit fore and aft adjusting movement of the associated end of the vehicle seat, latch operating means actuatable to unlatch the first latch means to permit forward movement of the first end of the vehicle seat, the first and second means pivoting the first and second ends of the vehicle seats relative the respective first and second adjuster track assemblies upon forward movement of the first end of the vehicle seat, and blocking means responsive to the relative pivotal position between the first end of the seat and the first adjuster track assembly and being effective to maintain the first latch means in unlatched position when the first end of the vehicle seat is pivoted relative the first adjuster track assembly to assure rearward return of the first end of the seat into transverse alignment with the second end of the seat before the first latch means returns to normal latched position.

3,933,332

SELF-SEALING TIE ASSEMBLY FOR ERECTING CONCRETE FORMS

Peter R. Lovisa, Pelham, and Dusan Tausanovitch, Northport, both of N.Y., assignors to Tullio E. Lovisa, Huntington, N.Y., a part interest

Continuation-in-part of Ser. No. 433,085, Jan. 14, 1974, abandoned. This application May 17, 1974, Ser. No. 470,923
Int. Cl.² E04G *17/08*
U.S. Cl. 249—42 **25 Claims**



1. The combination of a feed-through tie assembly and concrete forms, the feed-through tie assembly for mounting as a unit on the concrete forms and for removal therefrom as a unit without first disassembling the forms or the tie assembly and without requiring a lubricant thereon, said combination comprising:

opposed concrete forms spaced a selected distance apart;

an elongated tie rod having means disposed at each end thereof for cooperating in releasably mounting the tie rod in fixed position on the forms;

means associated with the tie rod between the ends thereof for mounting external spreader means to releasably hold the concrete forms a predetermined distance apart;

an elongatable, elastomeric sleeve positioned between the ends of the tie rod and being of a length greater than the selected distance between the forms, said elongatable, elastomeric sleeve when positioned through opposed openings in the forms being self sealing due to the lateral deformation and bubbling of the sleeve when it is in the openings by the compressive forces exerted by the concrete on the tie assembly thereby plugging the openings to provide a self sealing removable closure by the elastomeric sleeve;

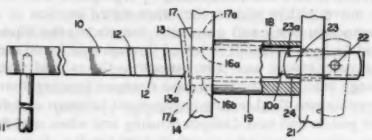
said sleeve and tie rod having interengageable surfaces for coupling the sleeve to the tie rod; and

guide means positioned over one end of the sleeve to facilitate insertion of the tie assembly through opposed spaced openings in the forms so that both ends of the sleeve are projected exteriorly of the space between the forms.

3,933,333
CLAMP FOR CONCRETE FORMS

Douglas G. Ellson, 209 S. Hillsdale Drive, Bloomington, Ind. 47401

Filed Dec. 23, 1974, Ser. No. 535,954
Int. Cl.² F04G 17/06
U.S. Cl. 249—43 5 Claims

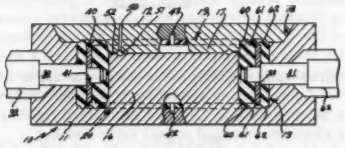


1. A clamp assembly for maintaining form members in predetermined spaced position during the depositing of flowable material between the members, said assembly including a shaft freely inserted into an enlarged aperture in the outer face of one form member, across the space between said form members and freely through an aperture of smaller dimension in the other form member, a spacer on the shaft having an outer transverse dimension smaller than said enlarged aperture but larger than said smaller aperture and a longitudinal dimension substantially equal to said predetermined space between the forms, an eccentric passage formed in and extending longitudinally through said spacer freely accommodating said shaft, whereby said spacer member is passed through said enlarged aperture with said shaft when oriented in one position with relation to the shaft axis and blocked from withdrawal through said enlarged aperture when oriented in another position with relation to the shaft axis, latching means on the remote end of said shaft which can be selectively actuated to prevent withdrawal of the shaft from said aperture in the other form member and deactuated to permit withdrawal, a plug member on said shaft for closing the space between said shaft and the margin of said enlarged aperture, and releasable means cooperating with said shaft to press said one form member against the adjacent end face of said spacer, whereby after deposit of the flowable material between said members, said latching means may be deactuated, said releasable means released and said shaft withdrawn for reuse leaving said spacer in situ between said members.

3,933,334
BUTTERFLY VALVE SEAT MOLD

Robert B. Edwards, Milton Township, Cass County, Mich., assignor to Nibco, Inc., Elkhart, Ind.

Division of Ser. No. 370,765, June 18, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,799
Int. Cl.² B29F 1/022; B29C 1/14
U.S. Cl. 249—57 1 Claim



1. A mold for making the annular resilient disc seat for a butterfly valve which seat has a plurality of axially projecting, concentric, circular beads on each of its axial side faces and a rigid reinforcement ring embedded within the elastomeric body of the seat, the ring having a pair of diametrically positioned holes, said mold having an annular cavity defined by a pair of concentric inner and outer walls and a pair of end faces spaced apart corresponding to the axial thickness of the seat to be molded therein, said mold having concentric circular channels for forming said beads on said ring; said mold having means projecting into the mold cavity radially thereof for forming a pair of diametrically opposed openings in the seat for the disc supporting shafts and extending through the openings in the ring for supporting said ring in spaced relationship to both of said faces, said mold characterized by a pair of pins projecting into said mold cavity, said pins being aligned and extending toward each other from opposite ones of said faces of said mold, the inner end of each of said pins extending an equal distance from its adjacent end face, said inner ends being spaced apart a distance equal to the width of said reinforcement ring; said pins being located approximately midway between said projecting means circumferentially of the mold cavity and between a pair of said channels whereby the resulting openings in the ring will be between a pair of said beads; said pins having a cross-sectional size no greater than the wall thickness of the reinforcing ring.

3,933,335
CASTING MOLD FOR METALS

Nobuo Maruyama, Tokyo, and Yasuo Sakaguchi, Iwaki, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

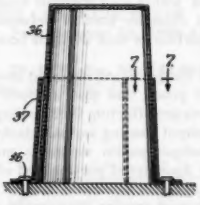
Filed Mar. 21, 1972, Ser. No. 236,788
Claims priority, application Japan, Apr. 1, 1971, 46-19226
Int. Cl.³ A47F 7/00
U.S. Cl. 249—114 5 Claims

1. In a casting mold for obtention of cast metal articles of superior surface quality, the improvement which comprises a lining adhered to the inner surface of said mold by means of an adhesive, said lining comprising a paper-like sheet of carbon fibers admixed with organic fibers or pulp, said carbon fibers being present in an amount of at least 35 percent by weight.

3,933,336
PIPE SLEEVE

Carl O. Tolf, Jr., St. Charles, Ill., assignor to Cato, Inc., St. Charles, Ill.

Filed Apr. 26, 1974, Ser. No. 464,370
Int. Cl.² B28B 7/28; B65D 21/00
U.S. Cl. 249—177 2 Claims

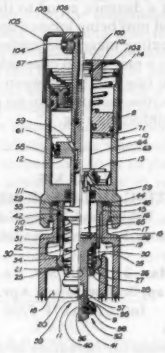


1. A pipe sleeve comprising a small diameter section and a large diameter section, both of said sections being tubular and having an angle of taper within the range of approximately 2° to approximately 4°, said small diameter section being telescoped into said large diameter section to bring the larger diameter ends of said two sections flush with each other, a radially outwardly extending flange formed on the larger diameter end of said large diameter section, and at least one longitudinally and radially outwardly extending rib formed on the outer surface of said small diameter section adjacent its larger diameter end, said rib tightly engaging the inner surface of said large diameter section and binding said sections in assembled relation.

3,933,337
TIME-DELAYED AUTOMATIC SHUT-OFF MEANS FOR VALVES

Earl L. Morris, and Theodore J. Sally, both of Whittier, Calif., assignors to Acorn Engineering Company, Industry, Calif.

Filed June 7, 1974, Ser. No. 477,190
Int. Cl.² F16K *21/06, 21/16, 31/48*
U.S. Cl. 251—54 **14 Claims**



1. A liquid-filled, dashpot mechanism, comprising:

a. a dashpot housing having a dashpot chamber and a reservoir chamber wherein said liquid is disposed, said dashpot housing having portions of unequal diameters therein with rims thereabout;

b. a stem means interposed in said dashpot housing and a portion of said stem means being disposed within said smaller diametered portion in contiguous relationship to said rim of said smaller diametered portion and slidably operable therein and projecting therebeyond;

c. means for effecting a fluid sealing relationship between said rim of said smaller diametered portion and stem means;

d. a dashpot piston means smaller in diameter than said larger diametered portion and fixedly disposed on said stem means, said dashpot piston means being operably disposed within said dashpot housing and capping said dashpot chamber formed between said smaller diametered portion in said dashpot housing and said dashpot piston;

e. flexible flange means disposed about and inbetween said dashpot piston and said dashpot housing, said flexible flange means effecting fluid sealing engagement between said dashpot housing and said dashpot piston means when said dashpot piston means is moved away from said smaller diametered portion and effecting non-fluid sealing engagement when said dashpot piston means is moved towards said smaller diametered portion, thereby functioning as a check valve;

f. a reservoir piston means slidably mounted on said stem means between said larger diametered portion and said dashpot piston means and disposed in peripheral, slidable engagement with said dashpot housing, said reservoir piston capping said reservoir chamber formed in said dashpot housing between said dashpot piston and said reservoir piston disposed within said dashpot housing;

g. means for effecting fluid sealing relationship between said reservoir piston means and said stem means;

h. means for effecting a fluid sealing relationship between said reservoir piston means and said dashpot housing;

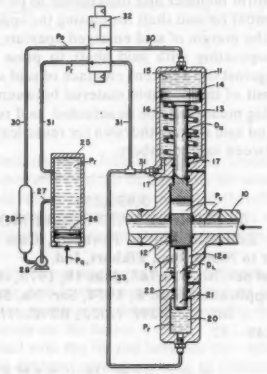
i. spring biasing means disposed between said reservoir piston means and said dashpot housing adjacent to said larger diametered portion in said dashpot housing for urging said reservoir piston means towards said dashpot piston means thereby maintaining said reservoir piston in full contact with said liquid in said reservoir chamber; and

j. a liquid metering passageway through said dashpot piston providing fluid communication between said dashpot chamber and said reservoir chamber, whereby when said dashpot piston is moved towards said smaller diametered portion in said dashpot housing by urging said stem means to move within said smaller diametered portion of said dashpot housing and outwardly therefrom, the liquid in said dashpot chamber is forced through said liquid metering passageway and simultaneously flexes said flexible flange means away from said dashpot housing thereby creating non-fluid sealing engagement between said dashpot piston and said dashpot housing and when said dashpot piston is moved away from said smaller diametered portion in said dashpot housing by urging said stem means to move inwardly into said dashpot housing through said smaller diametered portion in said dashpot housing, the liquid in said reservoir chamber flexes said flexible flange means towards said dashpot housing and into fluid selaing engagement therewith and is forced to pass solely through said liquid metering passageway from said reservoir chamber to said dashpot chamber thereby effecting time-delayed movement of said stem means.

3,933,338
BALANCED STEM FAIL-SAFE VALVE SYSTEM

David P. Herd; John W. McCaskill, both of Houston, Tex., and Thomas W. Childers, Mandeville, La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 21, 1974, Ser. No. 516,704
Int. Cl.² F16K *31/126*
U.S. Cl. 251—63.6 **12 Claims**



1. A hydraulically operable valve system for use in controlling flow of fluids through a submerged flowline comprising:

a valve housing arranged on said submerged flowline;

a valve chamber arranged in said valve housing;

a valve element movable in said valve chamber between open and closed positions for controlling the flow of fluids through said flowline;

first fluid pressure operable means connected to said valve element for urging said valve element from one to another of said positions of said valve element upon application of fluid pressure to said first fluid pressure operable means;

biading means arranged in said valve housing for urging said valve element from said other to said one of said positions of said valve element; and

second fluid pressure operable means detached from and engageable with said valve element to urge said valve element toward said one position of said valve element upon application of same or about same fluid pressure applied to said first fluid pressure operable means to counterbalance the force applied to said valve element by means of said first pressure operable means.

3,933,339
WATER FAUCET WITH SLIDER

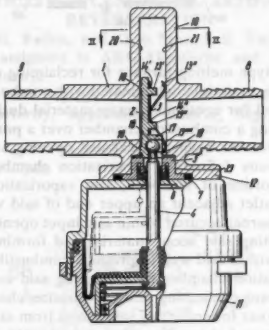
Kurt Dietzsch, Leonberg-Eltingen, Germany, assignor to Sudeutsche Kuhlerfabrik, Julius Fr. Behr, Stuttgart, Germany

Continuation of Ser. No. 413,353, Nov. 6, 1973, abandoned. This application May 20, 1975, Ser. No. 579,133

Claims priority, application Germany, Nov. 11, 1972, 2255278

Int. Cl.² F16K *31/165, 25/00*

U.S. Cl. 251—176 **9 Claims**



1. In a valve comprising a housing and a slider movable within said housing transversely to the direction of liquid flow through the valve, the improvement comprising:

said housing having a cooperative sealing surface on the interior thereof for said slider, a spring sliding surface opposite said cooperative sliding surface, and a sealed insert orifice at one end thereof;

an actuation rod linked to said slider by a universal or ball joint, said actuation rod extending into said housing through said sealed insert orifice;

said slider having a rectangular shape, a first face containing a toroidal sealing surface in slidable cooperation with said cooperative sealing surface, and a second face having a spring retaining surface, said slider being translational against said cooperative sealing surface in a direction normal to the direction of liquid flow; and

spring means for loading said toroidal slider sealing surface against said cooperative sealing surface at the center of mass of said slider sealing surface, said spring means comprising a spring retained against rotation on said spring retaining surface and having a center portion extending across the center of said slider and four spring legs extending outwardly from said center portion and terminating in sliding portions in sliding relationship with said spring sliding surface.

3,933,340
METHOD OF AND APPARATUS FOR DRY MIXING

Frank B. Krull, Highway M-35 Ingallstan, P.O. Box 55, Menominee, Mich. 49858

Continuation of Ser. No. 420,657, Nov. 30, 1973. This application Jan. 6, 1975, Ser. No. 538,883

Int. Cl.² B01F *13/06, 15/04, 15/02*

U.S. Cl. 259—14 **8 Claims**

1. A method of mixing dry powdered material which comprises:

A. providing a mixing drum having a mouth;

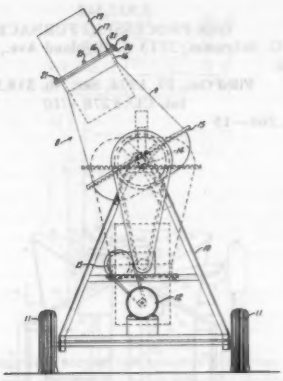
B. providing an open-topped container having an upper portion of a size to fit into the mouth of the mixing drum;

C. placing a hood over the open top of said container;

D. through a hole in the top of said hood, pouring the materials to be mixed into said container;

E. as the materials are poured into the container, maintaining a subatmospheric pressure in the hood by connecting its interior with a source of suction;

F. when all of the materials to be mixed have been poured into the open-topped container, lifting the hood from its position over the open top of the container;



G. with the mouth of the mixing drum facing downward, inserting the upper open-topped portion of the container into the mixing drum; and

H. securing the container to the mixing drum with the space between the sides of the container and the mouth of the mixing drum sealed, so that the container coacts with the mixing drum to form a closed chamber confining the materials to be mixed,

whereby mixing of the materials can be effected without dispersion of powdered material into the atmosphere.

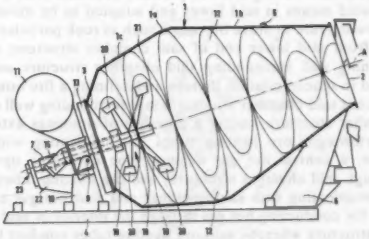
3,933,341
TRANSIT CONCRETE MIXER

Gerhard Hudelmaier, Frauenstrasse 22, 7900 Ulm, Danube, Germany

Filed Jan. 29, 1975, Ser. No. 545,002

Int. Cl.² B28C *5/18*

U.S. Cl. 259—174 **10 Claims**



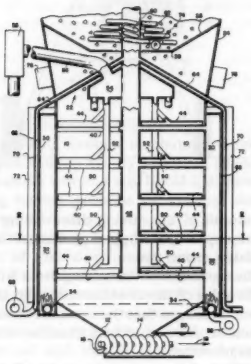
1. A transit concrete mixer wherein a mixing drum tapers conically toward a fill and discharge opening and is mounted on a vehicle frame for rotation on an axis which extends in the

direction from the drum bottom toward said opening on an upward slant relative to the horizontal by means of a stub axle secured to said drum bottom and projecting therefrom into a supporting bearing; wherein said drum is provided at its inner wall surface with axial concrete conveying elements and encloses a coaxial supplemental mixing tool which extends in the direction of the drum axis from said drum bottom over a range of not more than about one-half of the total drum length, said mixing tool being mounted on an overhung shaft associated with said drum bottom; and wherein drive means exteriorly of said drum are operatively connected to said mixing drum and to said overhung shaft.

3,933,342
ORE PROCESSING FURNACE

Arthur G. Schramm, 3113 E. Highland Ave., Phoenix, Ariz. 85016

Filed Oct. 29, 1974, Ser. No. 518,575
Int. Cl.² F27B 9/10
U.S. Cl. 266—15 **17 Claims**

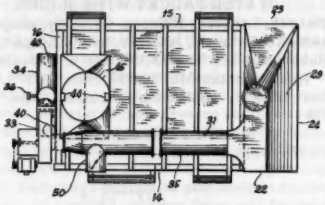


1. An ore processing furnace adapted for processing ores such as those containing antimony and which require temperatures ranging generally between 600° Fahrenheit and 1200° Fahrenheit; said furnace comprising: an ore containing and processing chamber structure having a surrounding wall and an upper open end provided with an ore receiver; said chamber structure having a lower partially enclosed end; a power operated means in said lower end adapted to be driven at a controlled rate to move ore waste such as rock particles or the like from said lower end of said chamber structure; a heat retaining wall surrounding said chamber structure and disposed in spaced relation thereto and defining a fire box space adjacent said chamber structure; said surrounding wall of said chamber structure having a plurality of openings extending therethrough; ore heating tubes communicating with said space; a central hot gas exhaust pipe extending upwardly through said chamber structure; said ore heating tubes intercommunicating with said openings and said hot gas exhaust pipe for conducting hot gas through the interior of said chamber structure whereby said ore heating tubes conduct heat to ore in said chamber structure; vapor collectors above said ore heating tubes; vapor conduits communicating with said vapor collectors and extending upwardly through said chamber structure.

3,933,343
METHOD AND APPARATUS FOR MELTING METALS

Robert K. Rawlings, Maumee, Ohio, assignor to U.S. Reduction Co., East Chicago, Ill.

Division of Ser. No. 284,244, Aug. 28, 1972, Pat. No. 3,839,016. This application Sept. 18, 1974, Ser. No. 507,078
Int. Cl.² F27B 17/00
U.S. Cl. 266—16 **8 Claims**

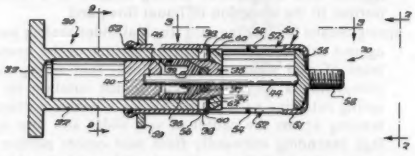


1. A well-type melting furnace for reclaiming metals from metallic scrap material contaminated with combustibles comprising: a well for containing scrap material during melting; means defining a combustion chamber over a portion of said well, said chamber having an exhaust opening and an input opening; means defining a vaporization chamber over the remaining portion of said well, said vaporization chamber having an outlet adjacent an upper end of said vaporization chamber; a burner secured within said input opening for heating and melting said scrap material and forming a molten metal pool within said well to produce combustible fumes in said vaporization chamber by vaporizing said combustibles; and duct means connecting said vaporization chamber outlet with said burner for collecting said fumes from said vaporization chamber and channeling them directly into and through said burner for ignition in said combustion chamber, said combustibles being thereby captured for utilization in melting said scrap material, and the exhaust of combustible fumes being thereby substantially eliminated.

3,933,344
LIQUID SPRING-SHOCK ABSORBER ASSEMBLY

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Continuation-in-part of Ser. No. 390,875, Aug. 23, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,601
Int. Cl.² F16F 5/00
U.S. Cl. 267—64 A **7 Claims**



1. In a liquid spring shock absorber assembly including housing means adapted to hold a body of fluid, a piston head having a longitudinal axis and slidably disposed within said housing means, a semi-flexible seal and retaining cap disposed within one end of said housing means, and a body of compressible fluid within said housing means the improvements comprising:

a. a piston rod slidably disposed along the longitudinal axis of said piston head and through said seal and cap and having a first end portion disposed outside said housing means and a second end portion frictionally engaged in a press fit relationship within said piston head, whereby the area of frictional engagement and the frictional force

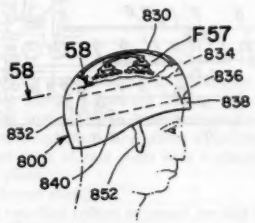
created by said press fit is sufficient to maintain said piston rod and said piston head in fixed engagement after said compressible fluid is pressurized within said housing means; and

b. a jacketing member having an open end slidably disposed over said housing means, a closed end abutting the first end portion of said piston rod, guide means for maintaining said open end in slidable disposition with said housing means, and a plurality of tow pins inserted through said housing means and into said retaining cap, said tow pins being aligned with said guide means, whereby said jacketing member accomodates tension loads applied to the shock abosrber assembly and none of said loads are transmitted to said piston rod.

3,933,345
ZIGZAG ARRANGEMENT OF HELICAL SPRINGS IN DEVICES FOR GENERATING ARTIFICIAL REVERBERATION

Werner Fidi, Baden, and Otto Marschall, Vienna, both of Austria, assignors to AKG-Akustische und Kino Gerate GmbH, Austria

Filed Sept. 6, 1974, Ser. No. 503,690
Claims priority, application Austria, Sept. 12, 1973, 7916/73
Int. Cl.² F16F *1/12*
U.S. Cl. 267—168 **8 Claims**



1. In a zigzag arrangement of helical springs, in devices for generating artificial reverberation, the improvement comprising, in combination, two consecutive portions of a single helical spring having their helical turns mutually interfitted with each other while remaining out of contact, and with their axes in substantially tangential contact; and means firmly interconnecting adjacent ends of said two consecutive helical spring portions to each other directly at the deflection point of the two consecutive helical spring portions.

3,933,346
CLAMPING OR GRIPPING DEVICES

Leonard John Carver, Little Haywood, England, assignor to Carver & Co. (Engineers), Walsall, England

Filed Apr. 1, 1974, Ser. No. 456,497
Claims priority, application United Kingdom, Apr. 17, 1973, 18402/73
Int. Cl.² B25B *1/02, 1/08*
U.S. Cl. 269—4 **9 Claims**

1. A clamping or gripping device comprising:

a a handle including an elongated shaft for holding the device in one hand to position it relatively to work to be clamped or gripped;

b a first elongated jaw mounted on said handle and extending in a direction transverse to said shaft;

c a carrier slidably mounted on said shaft for movement towards and away from said first jaw, said carrier having a portion thereof in contact with one side of said shaft;

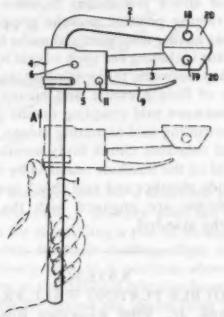
d frictional resistance means on said carrier and in sliding contact with said shaft to retain said carrier against movement along said shaft under the influence of gravity;

e a second elongated jaw having a radiused inner end;

f means mounting said second jaw on said carrier for pivotal movement about an axis and at a position such that the surface of the radiused inner end thereof abuts the side of said shaft, opposite said one side;

g a lever pivotally mounted on said carrier and having a cam edge face;

h a thrust block interposed between said cam edge face and said second jaw, said block having a curved face engaging the surface of said cam face and a face slidingly engaging a surface of said second jaw at the side of said pivot axis opposite said radiused inner end; and



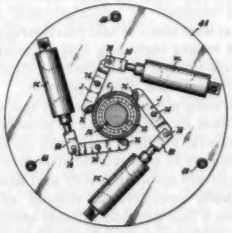
i means biasing said second jaw towards said lever;

j said lever being arranged such that when the device is held by said handle in one hand to position it relatively to the work, said lever is movable by said one hand from an inoperative position in a direction towards said shaft to cause leverage to be exerted, by cam action between said cam edge face and said thrust block against said biasing means, on said second jaw to cause clamping or gripping pressure to be applied against the work in the direction of said first jaw and said portion of said carrier and said radiused inner end of said second jaw to jam against said opposite sides of said shaft, respectively, whereby the carrier cannot be displaced along the shaft until said lever is returned to said inoperative position.

3,933,347
AIR CHUCK AND MANDREL FOR ROLL SLITTING MACHINE

Carl A. Stoffels, Flemington, N.J., assignor to Judelshon Industries, Inc., Jersey City, N.J.

Filed June 11, 1974, Ser. No. 468,340
Int. Cl.² B23Q *3/14*
U.S. Cl. 269—31 **11 Claims**



1. In a slitting machine for making radial cuts in a roll of material as said roll is rotated about a stationary mandrel, a fluid actuated chuck for gripping said roll of material, said

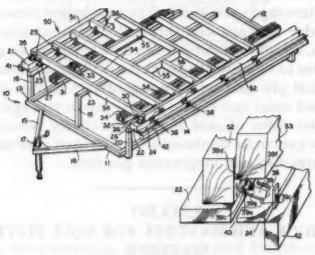
chuck including a stationary chuck body member mounted in the frame of said machine coaxially with said mandrel, a rotatable chuck body member coaxially mounted within said stationary chuck body member and bearing means therebetween providing free rotation of said rotatable chuck body member with respect to said stationary chuck body member, mandrel mounting means positioned within said chuck to receive one end of the mandrel for supporting said mandrel in a stationary non-rotating manner, chuck jaw means mounted on said rotatable chuck body member for movement between a gripping position in which said jaws engage said roll of material and a release position disengaged from the roll of material, fluid powdered actuation means operatively connected to said chuck jaw means to move said jaws means between the release position and the gripping position, fluid pressure means having multiple fluid paths for controlling said actuating means including for each of said multiple fluid paths coupling means between the rotatable chuck body member and a source of fluid pressure and means providing a fluid passageway between said coupling means and said actuating means for controlling said actuating means, drive means connected to said rotatable chuck body member for actuating a roll of material on the machine mandrel by rotating said rotatable chuck body member and said chuck jaw means when said chuck jaw means are engaged with the roll of material mounted on the mandrel.

3,933,348

DOUBLE PLATING WALL FRAMER

Carl E. Tidwell, Jr., 5800 Riverview Road, Mabelton, Ga. 30059

Filed Oct. 24, 1974, Ser. No. 517,456
Int. Cl.² B23P *19/00*
U.S. Cl. 269—303 **6 Claims**



1. Apparatus for supporting components of a frame structure, comprising:

first means defining positions for receiving a plurality of structural members in predetermined certain relation;

second means defining a position for receiving a second structural member in predetermined certain position adjacent at least some of said plural structural members;

said second means including first locating means against which a side surface of such second structural member is abutted to be in said certain position;

a second locating means mounted in spaced apart relation with said first locating means to provide abutment for a third structural member optionally positioned alongside and contiguous to said second structural member; and

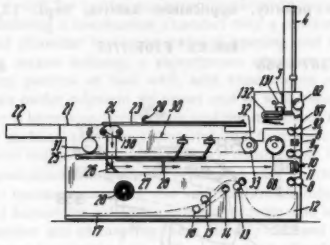
means operatively associated with said first locating means and normally operative to dispose said first locating means into a first position for said abutment with a second structural member and selectively operative to displace said first locating means from said first position in response to placement of a third structural member in abutment with said second locating means, so that the position of said third structural member is defined by abutment with said second locating means and by contiguity with said second structural member.

3,933,349

DOCUMENT COPYING MACHINE

Walter Limberger, deceased, late of Hamburg-Poppenbuttel, Germany; by Jurgen Limberger, heir, Hamburg-Poppenbuttel, Germany; by Ursula Limberger, heir, Hamburg-Poppenbuttle, Germany; Francois Prick van Wely, Travenberg, Germany, and Uwe Winzentsen, Hamburg, Germany, assignors to Lumoprint Zindler KG, Germany

Division of Ser. No. 351,288, April 16, 1973. This application Mar. 7, 1974, Ser. No. 449,021
Claims priority, application Germany, Apr. 20, 1972, 2219307
Int. Cl.² B65H *7/18*
U.S. Cl. 271—10 **6 Claims**

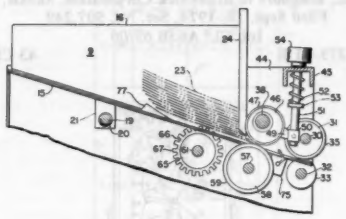


1. A copying machine for producing one or a number of copies from an original, comprising a casing having an upper surface, a reciprocally movable carriage mounted on the upper surface of said casing and arranged to support an original positioned thereon for movement with said carriage, chain drive means for said carriage including an endless circulating chain, a control shaft and a wheel assembly mounted on said control shaft and in engagement with said circulating chain, said wheel assembly providing rotational movement to said control shaft, a stack holder for copy sheet material with each copy sheet having a leading edge, means forming a guide path for the copy sheets through the casing and said guide path means including feed roller means for feeding individual copy sheets along the guide path, said feed roller means including a first pair of feed rollers forming a nip therebetween for gripping an individual copy sheet and passing it along said guide path, means for removing individual copy sheets from said stack holder and for introducing the copy sheets into the guide path, and a movable trip element positioned in the guide path from said stack holder immediately in front of said first pair of feed rollers, said movable trip element being arranged to hold the leading edge of a copy sheet withdrawn from the stack holder by said means for removing individual copy sheets until the carriage supporting the original has reached a predetermined position said trip element pivotally mounted in said casing for pivotal movement about an axis spaced from and in generally parallel relation with said control shaft, and means operatively connected to said trip element and supported on said control shaft for pivotally displacing said trip element from in front of said first pair of rollers so that the leading edge of a copy sheet can be freed for entry into the nip of said feed roller.

3,933,350
PAPER INSERT FEEDER

Frank J. Mignano, 293 8th St., Brooklyn, N.Y. 11215

Filed Dec. 9, 1974, Ser. No. 530,755
Int. Cl.² B65H 3/06, 5/04
U.S. Cl. 271—10 5 Claims

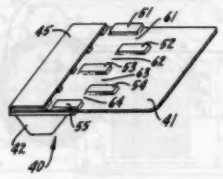


1. A feeder for paper inserts comprising, in combination,
a. a hopper having a forward sloping bottom plate, sides extending upward from said bottom plate and having front ends, and front stop plates extending inward from the front ends of said sides with a clearance over said bottom plate;
b. a first driven shaft;
c. at least two first rollers mounted on said first shaft;
d. a second spring mounted shaft;
e. second rollers mounted on said second shaft contacting said first rollers forming at least a pair of driven pinch rollers at the front of said bottom plate;
f. a third shaft extending across said hopper above said bottom plate in front of said front stop plates;
g. first transmission means enabling said first shaft to intermittently drive said third shaft;
h. a fourth shaft mounted below said bottom plate substantially under said front stop plates;
i. at least one front feed roller mounted on said fourth shaft, said bottom plate containing a first opening through which said at least one front feed roller projects;
j. gate means disposed in front of said front stop plates above said at least one front feed roller;
k. adjustment means positioning said gate means a distance over said at least one front feed roller to permit passage therebetween of a single paper insert;
l. a fifth shaft journalled behind said fourth shaft below said bottom plate;
m. second transmission means connecting said third shaft to said fourth and fifth shafts so that said third shaft drives said fourth and fifth shafts; and
n. at least one pair of rear feed rollers mounted on said fifth shaft, said bottom plate containing second openings through which said rear feed rollers project, said paper inserts being stacked in said hopper between said sides against said front stop plates and resting at least partially on said at least one pair of rear feed rollers, said first transmission means intermittently driving said third shaft and thereby said front and rear feed rollers advancing a lowermost paper insert into said at least one pair of pinch rollers.

3,933,351
SHEET DELIVERY ARRANGEMENT HAVING AN AIR-STREAM SHEET RETARDER

Peter Mayer, Mulheim, and Siegfried Schuhmann, Offenbach, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Nov. 22, 1974, Ser. No. 526,156
Claims priority, application Germany, Nov. 22, 1973, 2358206
Int. Cl.² B65H 29/68
U.S. Cl. 271—183 7 Claims



1. In a delivery arrangement for a sheet-fed printing press for delivering sheets onto a delivery pile, the combination comprising means for supporting a pile of sheets, a conveyor for conveying sheets by their leading edges longitudinally along a sheet delivery path to a position above the pile, a take-off mechanism at the delivery pile synchronized with the arrival of the sheets for taking the sheets from the conveyor and for decelerating the leading edges thereof for depositing them on the pile, a nozzle assembly including spaced fingers defining a series of nozzles spaced edge to edge in a plane, a source of air under pressure for feeding the nozzle assembly, the nozzle assembly being located adjacent the pile below the level of the approaching sheets and extending along the width of the sheets so that laterally spaced jets of air are directed substantially parallel to the underside of each sheet in a direction upstream of sheet movement, a guide plate spaced under the sheet path and extending from the nozzle assembly in the upstream direction tending to confine the jets of air under an arriving sheet, the surface of the guide plate having formed on the surface thereof a plurality of upraised islands laterally spaced from one another so as to be in respective alinement with the fingers between the jets, the islands presenting plateau surfaces at approximately the same elevation above the guide plate and substantially parallel thereto and extending above the plane of the nozzles so that when the sheet is sucked downwardly by the effect of the jets it is drawn to the plateau surfaces in light frictional engagement to apply frictional drag to the body of the sheet while preventing fluttering thereof.

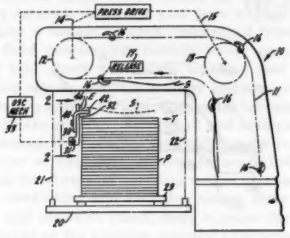
3,933,352
SHEET PILE DELIVERY FOR PRINTING PRESSES

Helmut Sinn, Wiesloch, Baiertal, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Dec. 11, 1974, Ser. No. 531,811
Int. Cl.² B65H 29/34, 29/04
U.S. Cl. 271—189 6 Claims

6. In a sheet delivery arrangement for a sheet-fed lithograph press, the combination comprising a driven sheet conveyor having grippers at spaced intervals, a platform under the conveyor, releasing means acting upon the grippers in predetermined phase position for dropping sheets seriatim toward the platform to form a pile thereon, means including a vertically extending jogging element at the top of the pile and extending along at least one side thereof, means for oscillating the jogging element for cyclical engagement of the edge of successively dropped sheets to square up the pile, an interceptor member associated with the jogging element and projecting horizontally inward above the pile, the interceptor member being made up of a horizontal ledge portion and a vertical portion rigidly joined together in intersecting relation to form

a deep, positive generally right-angled pocket for the leading edge of the sheet, means mounting the interceptor member for horizontal movement between a sheet intercepting position and a retracted position in which it is clear of the pile, and a cyclical drive connection between the conveyor and the interceptor member so phased that the interceptor member is in its intercepting position as a sheet from the conveyor arrives at the pile, the leading edge of the sheet being thereby engaged and temporarily supported in the pocket of the interceptor



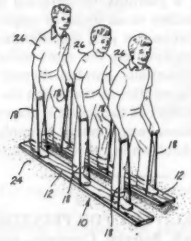
member in registered relation above the level of the pile while the body of the sheet settles on pile so that the leading edge cannot, by reason of curling, become inserted between the jogging element and the pile, the interceptor member being subsequently retracted during the course of its cyclical movement with the body of the sheet being held by friction against the pile so that the engaged edge of the sheet may become fully supported upon the pile for edgewise engagement by the jogging element.

3,933,353

GAME DEVICE FOR TWO OR MORE PERSONS WHICH IS USED WITH THE FEET

Charles M. Marsh, Rte. 1, Box 75, Bristol, Ind. 46507

Filed Apr. 28, 1975, Ser. No. 572,171
Int. Cl.² A63B *23/04*
U.S. Cl. 272—70 **3 Claims**



1. A game for two or more players and used with the feet comprising a pair of rigid strip members, each member having upper and lower faces, first and second loop parts connected to each member between the ends of the member, each loop part having two end portions and an intermediate bight portion and bein secured to its connecting member at its end portions with its bight portion projecting from the upper face of the member, the end portions of each loop part being spaced apart along a line extending transversely of its connecting member, said strip members each being of a width to accommodate a players foot and being of a length to allow at least two players to stand adjacently thereon, each said transverse spacing of said end portions being of a distance to accommodate a players foot therebetween and being of such longitudinal spacing such that when said members are placed side by side upon the ground generally paralleling one another one player may stand with one foot upon each member upper face positioned between the end portions of a said loop part with a hand gripping the bight portion of the loop part and a second player may stand next to said one player with one foot upon each member upper face positioned between the end portions of another loop part with a hand gripping the bight portion of the loop part to allow said players to walk in unison causing a shuffling motion of said members over the ground while holding said members against their feet by pulling upwardly on said loop parts.

3,933,354

REFLEX TESTING AMUSEMENT DEVICE

Adolph E. Goldfarb, Tarzana, and Erwin Benkoe, Encino, both of Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed Sept. 18, 1974, Ser. No. 507,249
Int. Cl.² A63B *69/00*
U.S. Cl. 273—1 E **43 Claims**

35. An amusement device for simulating competition in the martial arts comprising:

a pair of substantially identical pictures of a combatant, each picture set at an angle with respect to a vertical plane;

two series of lights, each series of lights camouflaged behind the surface of its respective picture such that the positions of the individual lights can only be seen when they are illuminated;

means for detecting when a picture has been hit in the immediate vicinity of a light;

switching means for extinguishing a light in each series and for illuminating another light in each series each time either picture is hit in the vicinity of an illuminated light;

means for determining which picture has hit first for each illuminated light in the series; and

means for totaling the score of such first hits for each participant.

3,933,355

SIMULATED TENNIS GAME

Donald Pearce, 111-D Village Lane, Greensboro, N.C. 27409

Filed Sept. 16, 1974, Ser. No. 506,548
Int. Cl.² A63F *3/00*
U.S. Cl. 273—85 R **4 Claims**

1. A simulated tennis game comprising:

a. a playing board having a tennis court scale diagram with various landing areas indicated thereon, player pieces, at least one ball marker piece, and a random selector means;

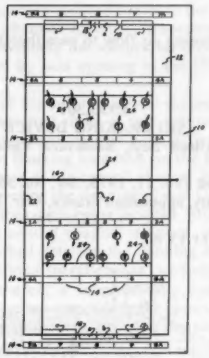
b. a ball flight indicator means, selectively positionable on said playing board, for selectively indicating the intended path of a stroked ball, and for indicating the speed, magnitude of travel, and point of first bounce of a stroked ball, said random selector means determining said speed and magnitude;

c. a ball bounce indicator means positionable at said point of first bounce along the path of a stroked ball for indicating the allowable return area between the first and second bounce of a ball, said random selector means determining

the distance between said first and second bounce on the board;

d. a player position indicator means, selectively positionable on the playing board, for selectively indicating the direction of player piece movement, and the magnitude of player piece movement during the course of play, said random selector means determining said magnitude of player piece movement; and

e. a chart means carrying indicia indicative of results of selected shots, said random selector means cooperating with said chart means for determining a particular result.



3,933,356

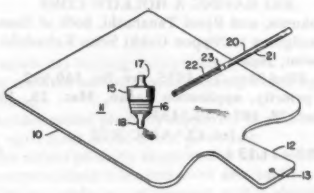
TOP AND APPARATUS FOR PLAYING THEREWITH

Abraham M. Torgow, 185 E. 206th St., Bronx, N.Y. 10458

Continuation-in-part of Ser. No. 341,862, March 16, 1973, Pat. No. 3,863,925. This application Nov. 29, 1974, Ser. No. 528,043

Int. Cl.² A63F 9/00; A63H 1/12

U.S. Cl. 273—108 **3 Claims**



1. A top and apparatus for play therewith comprising, in combination, a top having a substantially cylindrical downwardly tapering body at least one half the height of said top, and having upper and lower projections extending from said body to be hand twirled to initially spin said top, a board for spinning said top thereon, said board having a handle extending from one side thereof, and a whip for striking said top while spinning on said board to accelerate the spinning of said top, said whip having a handle and a flexible whip element of foam rubber projecting from said whip handle for striking said top.

3,933,357

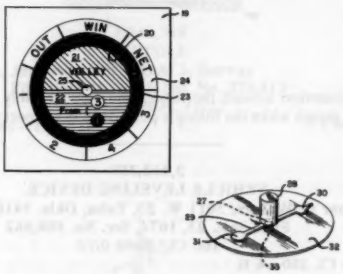
SPINNER ASSEMBLY FOR BOARD GAME

Donald W. Mercer, and Edward C. Horey, Jr., both of Pittsburgh, Pa., assignors to Donbee Corporation, Pittsburgh, Pa.

Division of Ser. No. 267,399, June 29, 1972, Pat. No. 3,853,322. This application Apr. 15, 1974, Ser. No. 461,039

Int. Cl.² A63F 5/04

U.S. Cl. 273—141 R **7 Claims**



1. A spinner assembly for a board game comprising

a transparent spinner disc having an opening therethrough, said spinner disc having an upper surface and a lower surface,

a spinner shaft having a first portion and a second portion, said spinner shaft first portion originating above said spinner disc upper surface, extending through said disc opening and projecting beyond said spinner disc lower surface, said spinner shaft being fixedly secured to said spinner disc, said spinner shaft second portion providing a finger grip on said spinner shaft first portion above said spinner disc upper surface,

a pointer arm pivotally mounted on said spinner shaft first portion between said spinner disc upper surface and said spinner shaft second portion,

the radial extent of said transparent spinner disc being at least as great as the greatest radial extent of said pointer arm,

a number of spinner scale elements each representing different player options and each having an opening therein for receipt of said spinner shaft first portion projection,

one said spinner scale element underlying said spinner disc and having a said opening generally aligned with said spinner disc opening, and

said spinner shaft first portion projection removably secured within said spinner scale element opening, whereby a single spinner disc, spinner shaft and pointer arm combination will function as a unit and may be employed sequentially with said spinner scale elements by removing said spinner shaft first portion projection from said spinner scale element opening and inserting said first portion projection into the opening of another said spinner scale element.

3,933,358

O-RING PORT CONTOUR SHEATH AND SEAL

Kenneth Leon Hoer, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

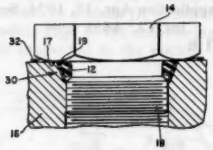
Filed Nov. 7, 1974, Ser. No. 521,621

Int. Cl.² B16J 15/10

U.S. Cl. 277—170 **3 Claims**

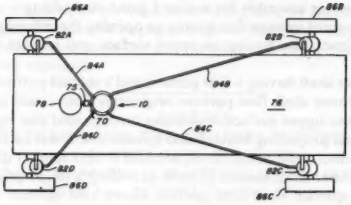
1. For use in combination with a frusto-conical port contour and a fitting, a seal comprising: a frusto-conical contour sheath of a heat-resisting, non-porous, extrudable, low coeffi-

cient of friction material for positioning over the frusto-conical port contour; and a non-porous, elastomeric, toroidal ring



for insertion around the fitting and compressably nesting in said sheath when the fitting is positioned in the port contour.

3,933,359
VEHICLE LEVELING DEVICE
Arthur G. Wallace, 3011 W. 53, Tulsa, Okla. 74103
Filed Sept. 23, 1074, Ser. No. 508,062
Int. Cl.² B60S 9/10
U.S. Cl. 280—6 H **10 Claims**



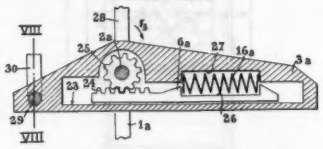
1. A vehicle leveling system comprising
a. a vehicle having a frame to be maintained in a horizontal position, said frame having at least three spaced points of support;
b. pressure fluid lift cylinder means in each of said points of support, said lift cylinder means connected by conduit to a pressure fluid control chamber;
c. said pressure fluid control chamber comprising a cylinder having a base attached to said frame to be coplanar therewith;
d. a plumb bob axially supported in said chamber by a flexible wire, said plumb bob in the shape of an inverted truncated cone;
e. a plurality of at least three valves mounted circumferentially spaced in the wall of said chamber at a selected horizontal plane relative to said plumb bob, and valve stems projecting inwardly from each valve to the surface of said plumb bob when said base is horizontal, said valves connected by said conduits to said lift cylinders; and
f. means to provide pressure fluid to the interior of said control chamber.

3,933,360
SKI
Fusaji Arai, 4940, Oaza-Ohmachi, Ohmachi, Nagano, Japan
Filed Jan. 2, 1975, Ser. No. 537,938
Int. Cl.² A63C 5/04
U.S. Cl. 280—11.13 S **4 Claims**

1. A ski including at least a body and a top bend portion extending from one end of said body, said top bend portion being provided with a plurality of air holes passing through said top bend portion from the front to the back surface

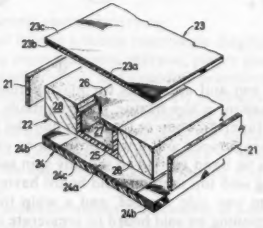
thereof and allowing air flow to pass therethrough in gliding of said ski.

3,933,361
SKI BRAKING DEVICE
Jean Joseph Alfred Beyl, Boulevard Victor Hugo, Nevers, France
Filed Feb. 21, 1975, Ser. No. 551,905
Claims priority, application France, Mar. 1, 1974, 74.06969
Int. Cl.² A63C 7/10
U.S. Cl. 280—11.13 B **2 Claims**



1. Ski braking device for stopping the free sliding of a ski on snow in case the ski is accidentally or otherwise separated from the ski boot comprising a pivoting braking lever adapted to be brought into frictional contact with, or sunk into, the snow under the force of a spring, said lever being rotatably rigid with a rotary shaft extending across the ski, said rotary shaft being coupled through mechanical means adapted to convert rotation of the shaft into translation of said mechanical means, said mechanical means comprising a toothed pinion rigid with said shaft and a rack portion, said rack portion being movable in the longitudinal direction and responsive to a compression spring reacting against a member substantially fixed in the longidutinal direction.

3,933,362
SKI HAVING A HOLLOW CORE
Kenichi Sakuma, and Ryozi Tanahashi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Mar. 21, 1975, Ser. No. 560,592
Claims priority, application Japan, Mar. 25, 1974, 49-33257; Mar. 28, 1974, 49-34359
Int. Cl.² A63C 5/12
U.S. Cl. 280—11.13 L **5 Claims**



1. A ski having a hollow core assembly provided with a ski top constituting unit firmly laminated to the top surface of the

core assembly, and a ski bottom constituting unit firmly laminated to the bottom side of said core assembly, said hollow core assembly comprising:

a central channel member having a substantially U-shaped cross section and being positioned at a substantially central part of the ski relative to the transverse direction thereof and extending longitudinally thereof, said central channel member of U-shaped cross section having a pair of leg members defining an opening therebetween on the free end side thereof,

two flanking members secured firmly to the lateral sides of said central channel member, respectively, and each having a substantially flat surface on that side of the ski which is faced by said opening of the U-shaped central member,

said end edges of the substantially U-shaped central member being positioned short of said substantially flat surfaces of the two flanking members, defining a space between the two flanking members on the free end side of the leg members of the central channel member, and

a cover plate covering the opening of said U-shaped central channel member and being bonded firmly to the end edges of said central channel member, said cover plate being sandwiched between the flanking members within said space defined therebetween, whereby said core assembly has therein a longitudinally extending central hollow structure at substantially the central part of the ski relative to the transverse direction thereof.

3,933,363

SAFETY SKI BINDING

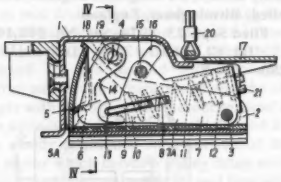
Gottfried Schweizer, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed Sept. 30, 1974, Ser. No. 510,605

Claims priority, application Austria, Oct. 4, 1973, 8496/73

Int. Cl.² A63C *9/08*

U.S. Cl. 280—11.35 T **10 Claims**



1. A safety ski binding, comprising:

a base member having means defining a locking projection thereon;

sole holder means pivotally supported to said base member for movement about a first pivot axis;

support means pivotally supported to said base member for movement about a second pivot axis, said support means including guide means thereon and a movable locking part guided for movement by said guide means;

a locking member pivotally supported on said sole holder means, said locking member having a recess therein receiving said locking projection when said sole holder means is in a position of use;

resilient means mounted on and movable with said support means, said resilient means being positioned between and engaging said support means and said locking part to resiliently urge said locking part into engagement with said locking member so that said locking member is also urged by said resilient means into engagement with said locking projection, said locking projection being maintained in said recess by the force of said resilient means; and

release lever means pivotally supported on said sole holder means for movement between first and second limits about a third pivot axis, said release lever means including securement means for securing said release lever means to said support means, whereby a pivoting movement of said release lever means about said third pivot axis will effect a pivoting movement of said support means about said second pivot axis to prevent said resilient means from resiliently urging said locking part into engagement with said locking member so that said sole holder is free to pivot about said first pivot axis.

3,933,364

SKI POLE

Bror With, Jarlsborgveien 1, Oslo 3, Norway

Filed July 10, 1972, Ser. No. 270,513

Int. Cl.² A63C *11/22*

U.S. Cl. 280—11.37 D **7 Claims**

1. A ski pole comprising a rod having upper and lower end portions with hand strap and disc, wherein a substantial intermediate part of said rod comprises a tube of a material having a high modulus of elasticity, such as metal, at least one end of said rod comprising a portion of a lower modulus of elasticity, such as plastic, connected to the intermediate part at a location spaced from the adjacent one of the hand strap and the disc.

3,933,365

DEVICE FOR HOLDING TOGETHER A PAIR OF SKIS

Ralf Brangenberg, Riffelstrasse 46, 81 Garmisch-Parten Kirchen, Germany

Filed Nov. 7, 1974, Ser. No. 521,756

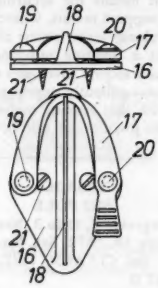
Claims priority, application Germany, Nov. 10, 1973, 2356312

Int. Cl.² A63C *11/02*

U.S. Cl. 280—11.37 A **2 Claims**

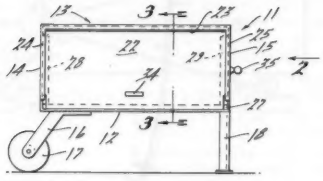
1. Holder for a pair of skis arranged to grip said skis in a stacked configuration, including a rhomboidally-shaped connecting plate for mounting upon the flat surface of the longitudinal axis of one of said stacked skis, said plate including a scraping strip in the form of an upwardly extending rib disposed over the long diagonal axis of said plate; a single elastic and flexible tensioning element having at least one opening;

and a holding pin mounted at an obtuse angle on said plate, said tensioning element engaging said holding pin by means of



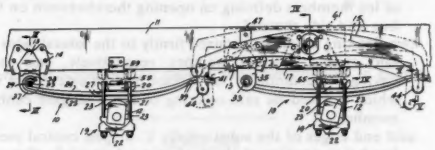
said opening, said tensioning element secured to said plate opposite said holding pin.

3,933,366
CONTAINER FOR REFUSE BAGS
William C. Wilburn, 18403 Santa Rosa, Detroit, Mich. 48221
Filed Sept. 27, 1973, Ser. No. 401,435
Int. Cl.² B62B *1/18*; B65D *43/18*
U.S. Cl. 280—47.31 **8 Claims**



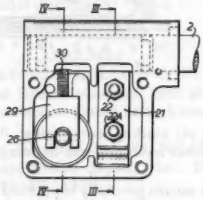
7. A container for refuse bags comprising a bottom of rectangular shape, a cover having a fixed portion extending upwardly from the rear edge of said bottom and curving around over the top thereof, the upper edge of said fixed cover portion being located past the center plane of the container, a lid portion of the cover having a curved shape similar to that of the fixed cover portion and movable between open and closed positions, the lid portion in its closed position having an upper section underlying a section of the fixed cover portion and a lower edge closely adjacent the forward edge of the container bottom, whereby said refuse bags need be lifted only approximately to the level of said bottom in order to deposit them in the container when the lid portion is open, a pair of end walls on the container having straight lower edges connected to the bottom and curved upper edges connected to the fixed cover portion, a pair of flanges extending inwardly from said end walls, said flanges being substantially parallel to said fixed cover portion and extending forwardly and downwardly toward the forward edge of said container bottom, friction-reducing means carried by said lid portion and disposed between said flanges and said fixed cover portion, said flanges being closely adjacent the edges of said lid portion along most of its extent, whereby said flanges both guide and support said lid portion during its movement, a wheel below the forward portion of said container bottom, a pair of fixed legs extending downwardly from the rear portion of said container bottom, and a handle on the rear end wall for lifting the rear portion of said container.

3,933,367
DUAL LEAF SPRING SUSPENSION
Attila J. Tamas, Lexington, Ky., assignor to Dura Corporation, Southfield, Mich.
Filed July 3, 1974, Ser. No. 485,447
Int. Cl.² B60G *5/00*
U.S. Cl. 280—104.5 A **14 Claims**



3. In combination with a vehicle frame and an axle housing:
a leaf spring assembly comprising a pair of laminar leaf springs mutually coacting in load supporting relation throughout their length;
means connecting the spring assembly at one end in load supporting relation to the vehicle frame;
a rocker arm pivotally mounted on the frame and having a cam surface engagement with the opposite end of the spring assembly;
means connected the spring assembly intermediate its ends in load supporting relation to the axle housing;
said spring assembly providing a constant rate load supporting relation between the frame and the axle housing; and
supplementary spring means carried by the central portion of the spring assembly normally spaced from the frame and thrusting against the frame with progressively increasing spring rate under excessive suspension random loads.

3,933,368
LEVELLING VALVES
John Anthony Kellett, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed Sept. 23, 1974, Ser. No. 508,165
Int. Cl.² B60G *17/04*; F16K *11/16*
U.S. Cl. 280—124 F **15 Claims**



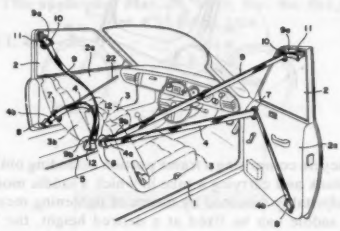
1. A levelling valve for a vehicle suspension system having an adjustable suspension member, comprising an inlet for connection to a source of pressure fluid, means defining an intermediate chamber adapted to be connected to said vehicle suspension member, an inlet valve for controlling the flow of pressure fluid from said inlet to said intermediate chamber, an exhaust valve for controlling the flow of pressure fluid from said intermediate chamber, said valves including respective valve operating members movable to open and close said valves and valve operating means including a movable member arranged to operate each of said inlet and exhaust valves, said movable member being pivotable with respect to said valve operating members of the respective valves, such pivoting with respect to either one valve operating member effecting movement of the other valve operating member to a valve open position.

3,933,369

SAFETY BELT DEVICES FOR VEHICLES

Yuichiro Kaneko; Fuminori Teraoka; Tatsushi Kubota, and Takehiko Nishikawa, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Oct. 30, 1972, Ser. No. 301,796
Claims priority, application Japan, Nov. 4, 1971, 46-87868
Int. Cl.² B60R 21/10
U.S. Cl. 280—150 SB 5 Claims



1. A safety belt device for vehicles, comprising: a first safety belt retractor provided on the inner surface of a door of a vehicle at a location opposite the outer side of a seat adjacent said door; a second safety belt retractor fixed to the central portion of a vehicle body; a first safety belt having one end connected to said first retractor and extending from said first retractor across said seat with the other end thereof secured to the inner side of the seat; a second safety belt having one end connected to said second retractor and extending obliquely from said second retractor across the chest portion of a passenger with the other end thereof secured to the upper portion of a door framework of the vehicle; and a belt driving mechanism wholly positioned in a portion of the door and including a motor which drives a pulley drum and a cup ring, a first drawing member connected to said first safety belt and moved by said motor around said pulley drum and two other pulley drums spaced apart from each other, a second drawing member connected to said second safety belt and moved by said motor around said cup ring and along the door framework of the vehicle at the same time said first drawing member is moved, a door switch incorporated in a door lock for controlling the direction of rotation of said motor, a seat switch provided below the seat and actuated to close a motor driving circuit when a passenger sits down on the seat, a first stop swich for controlling said motor in cooperation with a first actuator and a first stopper which is fixed to said first drawing member at a predetermined location between one of said two other pulley drums and said first actuator, and a second stop switch for controlling said motor in cooperation with a second actuator and a second stopper which is fixed to said first drawing member at a predetermined location between the other of said two other pulley drums and said second actuator, and said motor being set in motion by said door switch in timed relation with a door opening operation, whereby when the door is closed, said first safety belt and said second safety belt are retracted into said first retractor and said second retractor, respectively, and placed in their engaging position to restrain the waist and the chest portions of a passenger sitting on the seat.

3,933,370

EXPANSIBLE SEAT BELT FOR VEHICLES

Fumiyuki Abe, Yokohama, and Syuichi Otani, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 26, 1973, Ser. No. 418,839
Claims priority, application Japan, Nov. 27, 1972, 47-135420[U]
Int. Cl.² B60R 21/08
U.S. Cl. 280—150 AB 1 Claim

1. A safety device mounted on a vehicle having a body and a seat assembly, which comprises:

means for producing an electric signal when said vehicle collides with an object;

at least one occupant restraining seat belt mounted on said body and having therein at least two expansible sections in each of which a cavity extending along the length of said seat belt is formed;

at least two gas generators mounted on said expansible sections for generating pressurized gas in response to said electric signal and for feeding the pressurized gas into said cavity so as to cause said expansible sections to expand, each of said gas generators including a casing mounted on each of said expansible belt sections and defining therein a chamber communicating with each of said cavities, an ignitable chemical charge filling said chamber, electro-conductive wires embedded in said belt for conveying said electric signal, and an ignitor assembly located within said chamber and connected to said wires to be responsive to said electric signal; and

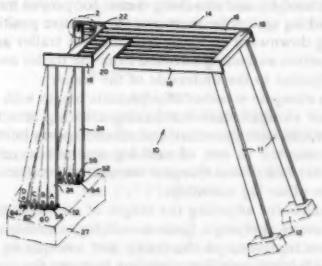
a reinforcing member of insulating material laid between said casing and said belt section.

3,933,371

OVERHEAD GUARD FOR LIFT TRUCKS

Frederick A. Graham, Bellevue, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 21, 1975, Ser. No. 570,288
Int. Cl.³ B60R 21/00
U.S. Cl. 280—150 C 12 Claims



1. In an industrial vehicle having an operator's compartment and a driver's overhead guard of generally inverted U-

shaped construction connected to the vehicle forwardly and rearwardly of the compartment, the improvement comprising a downwardly extending end support leg means pivotably connected at the upper end to one end portion of the overhead bridge of the guard and adjustable to a plurality of pivoted positions in relation to the bridge and to the vehicle, means secured to the upper end of the support leg means which extends outwardly therefrom contiguous to said one end portion of the bridge, and means for connecting said secured means to said contiguous one end portion at a location spaced from said pivotal connection at each position of said plurality of pivoted positions of said support leg means.

3,933,372

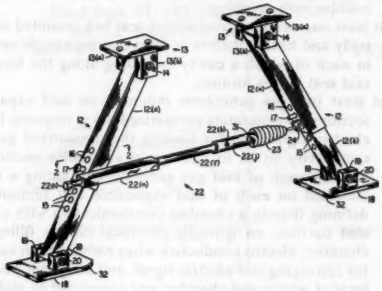
TRAILER STABILIZER

Robert R. Herndon, 206 Woodlawn St., Smithville, Tex. 37166

Continuation-in-part of Ser. No. 260,656, June 7, 1972, Pat. No. 3,801,128. This application Mar. 27, 1974, Ser. No. 455,226

Int. Cl.² B60S 9/02

U.S. Cl. 280—150.5 **3 Claims**



1. A stabilizing and leveling support assembly for trailers, comprising:

a. a pair of extensible leg assemblies,

b. means for attaching one end of said leg assemblies to the underside of a trailer, one leg assembly adjacent each lateral side of the trailer with said leg assemblies being secured by said attaching means for pivotal movement of said leg assemblies between an operative position extending downward and outward from the trailer and a raised position extending outward from the trailer and generally adjacent to the underside of the trailer,

c. an elongate member of adjustable length with one end of said elongate member having a spring attached axially thereto with the other end of said spring being pivotally connected to one of said leg assemblies, and with the other end of said elongate member pivotally connected to the other leg assembly,

d. means for adjusting the length of said elongate member thereby applying a force to said leg assemblies in a direction transverse to the trailer and towards or away from each other, said force tending to move the respective leg assemblies towards each other when the length of said elongate member is shortened and away from each other with the length of said elongate member is lengthened.

3,933,373

BICYCLE HAVING ARCHED MOUNTING TUBE FOR THE STEERING MEMBER

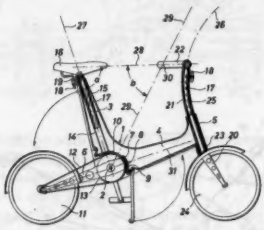
Niels Gammelgaard, Frederiksholms Kanal 18 A, 1220 Copenhagen K., Denmark

Filed Apr. 10, 1974, Ser. No. 459,792

Claims priority, application Denmark, Apr. 10, 1973, 1950/73

Int. Cl.² B62K 21/22

U.S. Cl. 280—278 **3 Claims**



1. A bicycle comprising a frame portion extending obliquely from a crank and carrying a tube in which a saddle mounting tube is adjustably mounted by means of tightening means, so that the saddle can be fixed at a desired height, the frame further having an oblique front fork tube in which a mounting tube for a steering member tube tube is adjustably mounted, said mounting tube extending upwardly from the frame portion which receives the front fork tube and being arched in such a way that the centre is positioned in front of the frame when the front wheel is in position for straight ahead driving, a steering member tube arched in the same way as the mounting tube and slidably mounted in the mounting tube, and tightening means for fixing the two arched tubes in relation to each other.

3,933,374

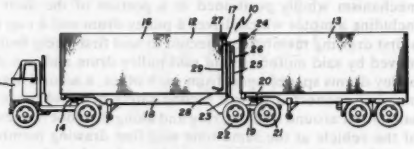
TANDEM TRAILER SYSTEM

Gerard A. Arguin, 3 Valley St., Spencer, Mass. 01562

Continuation of Ser. No. 370,744, June 18, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,786

Int. Cl.² B62D 53/08

U.S. Cl. 280—408 **6 Claims**



1. A trailer unit to be towed behind a highway tractor, and behind which may be towed another trailer, the trailer unit comprising:

a. a cargo container,

b. a chassis on which the container is mounted, the chassis having a first and a second end, a portion of the chassis associated with the second end extending downwardly and rigidly beyond an end of the cargo container,

c. first attaching means associated with the first end of the chassis by which the chassis can be connected to a highway tractor,

d. a second attaching means associated with the portion of the chassis which extends beyond the end of the cargo container, by which another standard trailer can be attached to the chassis, the second attaching means being entirely below a horizontal plane which includes the lowest portion of the cargo container and at the level of the first attaching means,

e. a single set only of wheels attached to the said portion of the chassis, at a point where the set is at least as far away from the first end as the second attaching means, an entrance to the cargo container being provided facing toward and adjacent the second end of the chassis, and

f. a horizontal platform provided between the cargo container entrance and a vertical plane including the second end of the chassis.

3,933,375

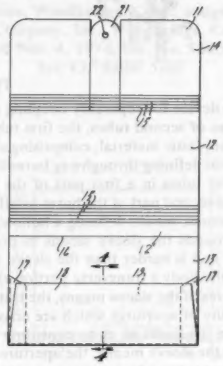
BOOK COVER

Norman J. Humphrey, 17123 Sprenger, East Detroit, Mich. 48021, and Lawrence A. Hages, Jr., 22449 Edmunton Drive, St. Clair Shores, Mich. 48036

Continuation of Ser. No. 419,482, Nov. 28, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,614

Int. Cl.² B42D *3/04*

U.S. Cl. 281—34 **2 Claims**



1. In a book cover and post card combination, a sheet of paper board cut to provide a central body portion for the back of a book, front and back cover portions extending from opposite edges edges of said body portion for the covers of the book, the edge of the front cover portion opposite to the body portion being folded back upon itself to form an inner pocket, the edge of the back cover portion opposite to the body portion being folded back upon itself to form an inner flap, a first scored line between the body portion and the front cover portion which provides a width for the front cover portion which equals the width of the front cover of a book, a plurality of scored lines in said central body portion spaced from said first scored line, one of which folds to have the free edges of the front and back cover portions disposed in aligned relation, a plurality of scored lines located adjacent to and forming the fold between the back cover portion and said flap, a tab cut inwardly from the edge of said flap opposite said fold and extending through said last mentioned plurality of scored lines to form a book mark for extending between the book pages at the edge opposite to said central body portion, and postcard decorative printed matter on the exposed side of the front cover portion located opposite to the side having the pocket, said pocket having a slot in the outer closed edge for receiving said tab and retaining the flap against said pocket when the front and back cover portions are engaged when folded on said one scored line so that the book cover can be employed as a postal card a postcard indication with an area for an address and a stamp on the outer side of the back cover portion to be on the opposite side from the post card decoration printed matter when the cover portions are secured as a postcard.

3,933,376

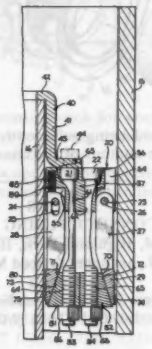
REMOVABLE PACKER AND TENSION SLIP ASSEMBLY

Edward T. Cugini, Brea, Calif., assignor to Grant Oil Tool Company, Los Angeles, Calif.

Filed Dec. 13, 1973, Ser. No. 424,289

Int. Cl.² F16L *55/00, 57/00, 21/00*

U.S. Cl. 285—23 **16 Claims**



1. A device for securing an inner coaxial pipe to an outer coaxial pipe and for forming a seal in the annulus between said coaxial pipes, comprising:

a. locking means having a plurality of circumferentially disposed engaging means, each said engaging means having first and second sides, said first side arranged and configured to selectively engage the walls of said coaxial pipes such that one of said coaxial pipes is placed in tension with respect to the other and held in position, said second side having at least one inclined surface which matingly engages with one of two setting rings, said setting rings being positioned in said annulus such that selective movement of said setting rings causes said first side of said engaging means to be disposed against the walls of said coaxial pipes; and

b. a temporary spacing and support plate coupled to said locking means positioning said locking means until said locking means is secured by said engaging means and supporting said locking means during retrieval of said locking means, said support plate arranged and configured in said device so as to be completely removable therefrom;

whereby said temporary spacing and support plate may be coupled to said locking means until said locking means is secured in position, after which said spacing and support plate may be removed without affecting said locking means.

3,933,377

HANGER ASSEMBLY FOR PIPE

Gordon W. Arrowood, Palmetto, Ga., assignor to McKenney's, Inc., Atlanta, Ga., a part interest

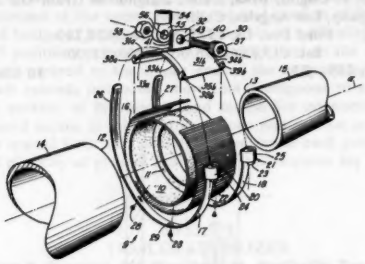
Filed May 30, 1974, Ser. No. 474,603

Int. Cl.² F16L *3/00*

U.S. Cl. 285—61 **12 Claims**

1. A hanger assembly comprising, in combination, a coupling for joining two end portions of pipes together and a stabilizer secured to said coupling, said stabilizer including a lug projecting away from said coupling by means of which the coupling and pipes can be supported from a supporting structure and a saddle carrying said lug, and a band for circum-

scribing a portion of the coupling, said band passing over a portion of said saddle, said saddle conforming to the contour



of said coupling and being sufficiently thin that it does not materially alter the contour of the circumscribing band.

3,933,378

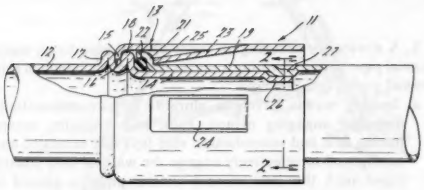
QUICK-CONNECT TUBING COUPLING

Phillip A. Sandford, Highland Park, Ill., and John D. York, Connersville, Ind., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 29, 1974, Ser. No. 528,108

Int. Cl.² F16L *39/00*

U.S. Cl. 285—319 **1 Claim**



1. A quick-connect tubing coupling comprising:

a first tube having a cup-shaped cage externally attached thereto,

the cup-shaped cage having an opened end and an apertured base wall spaced from the opened end through which aperture an end portion of first tube projects into the cage,

the first tube having spaced upset beads projecting externally from its outer surface and engaged with the outer and inner sides of the base wall of the cage holding the latter against axial movement,

the inside diameter of the cage being sufficiently greater than the outside diameter of the tube end portion contained therewithin to provide a space therebetween,

the cage having a plurality of cantilevered leaf springs that extend axially from the cage open end toward its base wall and that project radially inwardly toward the tube end portion within the cage,

some of the leaf springs being longer than the others,

an O-ring positioned on the tube end portion contained within said cage,

a second tube outwardly cupped at one end to encapsulate said O-ring,

the cupped end of the second tube being concentrically received between the cage and the first tube end portion,

the cupped end of the second tube providing a shoulder behind which the longer leaf springs can lock with said O-ring compressed in a sealed mode between said cupped end and the upset bead engaging the inner side of the base wall or behind which the shorter leaf springs can lock with the first and second tubes axially displaced so that said O-ring is released from its sealed mode to provide a pressure relief vent.

3,933,379

SEPARABLE COUPLING BETWEEN TWO TUBES AND ITS PRODUCTION PROCESS

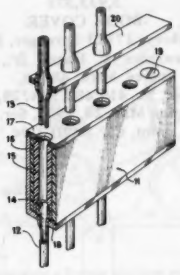
Jacques Pontigny, 14, Rue E. Legendre, 95 Margency, France

Filed Dec. 13, 1973, Ser. No. 426,724

Claims priority, application France, Dec. 22, 1972, 72.46072

Int. Cl.² F16L *47/00*

U.S. Cl. 285—381 **9 Claims**



6. A coupling device for separably coupling a series of first tubes and a series of second tubes, the first tubes being composed of a thermoplastic material; comprising sleeve means of elastomer material defining throughway bores for respectively receiving the first tubes in a first part of the bores and the second tubes in a second part of the bores axially adjacent said first part of the bores, means defining a hollow body which at least partly surrounds the sleeve means to position them in parallel relation and is harder than the sleeve means and has at a first end of the body a transverse portion extending transversely of the bores of the sleeve means, the transverse portion defining a plurality of apertures which are coaxial with but of smaller size than the bores so as to constitute abutments for axially retaining the sleeve means, the apertures affording the corresponding first tubes a free passage so as to allow the first tubes to enter the corresponding bores before final assembly of the first tubes with the sleeve means and body, the bores of the sleeve means having in the free state of the sleeve means in the body and before introduction of the first tubes and second tubes a diameter which is at the most equal to the diameter of the corresponding second tubes the first tubes being of a type having a plastic memory and capable of expanding upon application of heat and having an end portion which is engaged in the first part of the corresponding bores and is in an expanded state which is a result of the application of heat to said end portion sufficient to activate said plastic memory, said expanded end portions of the first tubes having such diameter that they put the sleeve means in a radially compressed state in said first part of the bores and extend radially beyond the corresponding apertures whereby said end portions of the first tubes are axially retained in the sleeve means in both directions, the second tubes being separably engaged in the second part of the corresponding bores.

3,933,380

LOCK MECHANISM

John F. Wellekens, 51 E. 42nd St., New York, N.Y. 10017

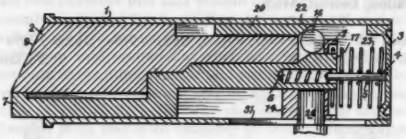
Filed Oct. 21, 1974, Ser. No. 516,640

Int. Cl.² E05C *1/10*; E05B *55/00*

U.S. Cl. 292—175 **4 Claims**

1. A lock mechanism comprising, a casing having a bolt outlet, a spring-biased bolt mounted within the casing and capable of projection therefrom to either a partially advanced or fully advanced position, a sensing bar arranged alongside of and in slidable contact with the bolt, said sensing bar being adapted to extend co-extensively with the bolt while the bolt is in its partially advanced position, a roller carried by the bolt,

a cam carried by the sensing bar and on which the roller rests while the bolt is in its fully retracted or partially advanced positions and while the sensing bar is co-extensive to the bolt, stop means for limiting movement of the roller while said

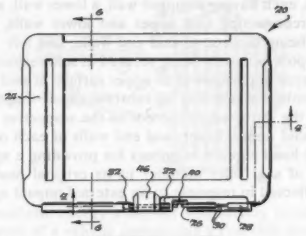


roller rests on the cam, the bolt having a sliding movement relatively to the sensing bar to bring it into fully advanced position when sliding movement of the sensing bar is prevented by contact with a striker plate on a door frame.

3,933,381
PLASTIC CONTAINER AND LATCH

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Nov. 4, 1974, Ser. No. 520,541
Int. Cl.² E05C 5/02
U.S. Cl. 292—57 **8 Claims**



1. A latch assembly for a container wherein the container includes a base portion and cover portion of double wall thermoplastic construction hingedly connected to one another for movement between open and closed positions relative thereto and with mating edges on said base and cover portions adapted to abut in the closed position of said cover portion, said latch assembly comprising:

a bolt means, one end of said bolt means being mounted within a groove on said cover portion and being axially slidable therein;

a bolt mounting portion disposed on said cover portion in alignment with said groove; and

locking apertures, at least one locking aperture disposed on said bolt mounting channel and on said base portion, said locking apertures being aligned with one another in the closed position of said cover portion for axially receiving the second end of said bolt means so that said cover and base portions may be selectively locked together.

3,933,382
SECURITY LOCK

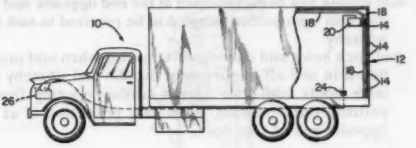
W. Ray Counts, Golden, and Wayne M. Schickedanz, Arvada, both of Colo., assignors to Transport Security Systems, Inc., Denver, Colo.

Filed July 13, 1973, Ser. No. 379,068
Int. Cl.² E05C 3/06
U.S. Cl. 292—144 **15 Claims**

1. In a lock for use with a moveable closure or the like having a two position bolt adapted to move into the path of movement of the closure to a locked position to prevent movement thereof or move out of the path of movement of the closure to unlocked position to permit movement thereof, the improvements, comprising:

a. electric motor means including a pair of solenoids adapted to be selectively energized for moving the bolt between its two positions,

b. means for preventing movement of the bolt when disposed at its two positions,



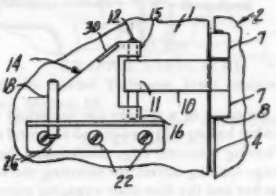
c. a two position control switch for energizing the motor means for selectively causing same to move the bolt between its two positions, and

d. other switch means operated by movement of the bolt for de-energizing the motor means when the bolt moves to its two positions.

3,933,383
LATCH

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109

Filed Sept. 20, 1974, Ser. No. 507,761
Int. Cl.² E05C 17/04, 17/06, 17/10, 17/32
U.S. Cl. 292—262 **4 Claims**



1. A safety latch for holding a closure of a closure structure such as a door, window or the like having a frame, a hinge edge and an opposite latch edge, comprising:

a first link,

means swingably connecting one end of said first link to such frame at the latch edge,

a second link swingably connected at one of its ends to an opposite end of said first link, and vertically slidable relative to the latter between upper and lower positions,

a keeper member carried by said closure and including a horizontally disposed flange formed with an elongated slot,

said second link being provided at the end opposite said one end with a projection adapted to be received in said slot,

said keeper member being provided with an upwardly projecting portion, whereby

said second link may be raised to its upper position and moved to a position between said portion and said closure and lowered to a position interposed between said portion and said closure to hold said closure against opening from a closed position with said projection at one end of said slot, and whereby said latch holds said closure against further openings from a partially open position when said second link is released from said interposed position and said projection is at the opposite end of said slot.

3. A safety latch for holding a door of a door structure that includes a frame, a hinge edge and an opposite latch edge, comprising:

a first link,

means swingably connecting one end of said first link to such frame at the latch edge,

a second link swingably connected at one of its ends to the opposite end of said first link,

a keeper member carried by said door and including a horizontally disposed flange formed with a horizontally elongated slot having a laterally offset portion at one end,

said second link being provided at the end opposite said one end with a projection adapted to be received in said slot, whereby

said latch holds said door against opening when said projection is in said offset portion of the slot and whereby said latch holds said door against further opening from a partially open position when said projection is at the opposite end of said slot.

3,933,384

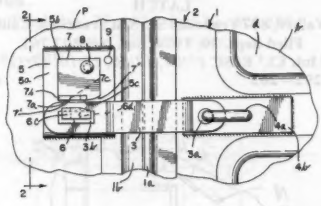
ANTI-PILFERAGE LOCKING DEVICE

James J. Schuller, Crete, Ill., and Ronald W. Marsh, Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 7, 1974, Ser. No. 512,774

Int. Cl. E05c *19/08*

U.S. Cl. 292—285 **3 Claims**



1. A door structure of a railway car including a first door engaging member having a first edge and a second door engaging member having a second edge confronting the first edge, an anti-pilferage locking device for securing the second door engaging member and the first door engaging member against longitudinal relative movement, the improvement comprising:

a keeper secured to the outer surface of the first member adjacent the first edge, said keeper including a substantially horizontal laterally outstanding portion and an elevated catch at its outer end having a vertical aperture therethrough,

an elongated hasp pivotally secured on the outer surface of the door adjacent the second edge and having a loose fit therewith for multi-pivotal movement,

said hasp having a free end portion having a slot therein, said slot in a locked position of said hasp receiving said keeper wherein said outstanding portion projects through said slot and said elevated catch overlaps a portion of said hasp to entrain the same against outward lateral movement,

a cam vertically spaced above said keeper, means pivotally securing said cam to the outer surface of the first member adjacent the first edge,

said cam including a bottom edge having a flat edge portion,

a flange projecting outwardly from said cam, said cam having an aperture therethrough in substantially vertical alignment with the aperture in said catch,

said means pivotally securing said cam to the outer surface of the first member being positioned vertically above said keeper and said flange and in substantial vertical alignment therewith whereby during a closed position of said hasp, said free end portion of said hasp is disposed immediately below said flat edge portion of said cam to restrain said hasp against upward movement,

and anti-pilferage locking means within said apertures to secure said hasp on said keeper.

3,933,385

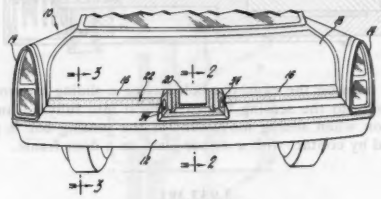
RESILIENT FILLER AND BUMPER SUPPORT ARRANGEMENT

Robert L. Sanford, Williamston, and Casimer J. Wesolek, Lansing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1975, Ser. No. 558,661

Int. Cl.² B60R *19/02, 19/06;* **B61F** *19/04;* **B62D** *27/04*

U.S. Cl. 293—63 **3 Claims**



1. A filler and support arrangement for use in the space between an automotive bumper assembly and an adjacent body portion, said bumper assembly including an exposed bumper and an unexposed reinforcement member secured to the inner surface of said bumper, said filler and support arrangement comprising a laterally extending flexible plastic filler member, left- and right-hand flexible plastic support members, each having an upper wall, a lower wall, and an end wall interconnecting said upper and lower walls, said filler member being secured to said end walls, said left- and right-hand support members being secured at said respective lower walls thereof to portions of an upper surface of said reinforcement member, a plurality of substantially U-shaped ribs secured at the outer edges thereof to the respective inner surfaces of said upper, lower, and end walls of each of said left- and right-hand support members for providing a spring-back reaction of said filler member to its original position after being deflected in response to an external impact against said bumper.

3,933,386

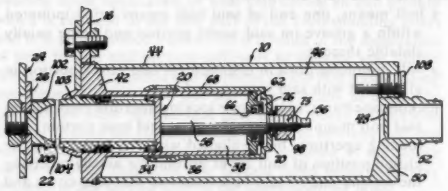
REBOUND CONTROL FOR ENERGY ABSORBER UNIT

Wayne V. Fannin, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,833

Int. Cl.² B60R *19/02*

U.S. Cl. 293—70 **4 Claims**



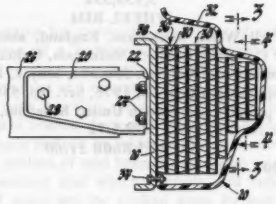
1. A telescoping energy absorbing unit for a vehicle operatively connecting a bumper assembly to the vehicle comprising a first cylinder secured to the vehicle, a piston assembly mounted for telescopic movement between first and second positions with respect to said first cylinder, said piston assembly having a piston and a piston rod axially projecting from said piston, means operatively connecting said piston rod to the bumper assembly, said piston cooperating with said first cylinder to form a first expansible and contractable chamber, a second cylinder mounted for sliding movement on said first cylinder and cooperating therewith to form a second expansible and contractable chamber, means drivingly connecting said second cylinder to said piston assembly for movement therewith, a sealed housing surrounding said first and second

cylinders and cooperating therewith to form a third chamber, a pressurized fluid medium in said first, second and third chambers, first valve means operatively connected between said first and second cylinders to permit the flow of fluid from said first chamber into said second chamber when said piston assembly is moved from said first position toward said second position and to subsequently restrict and meter the flow of fluid from said second chamber into said first chamber in response to the movement of said piston assembly back to said first position, and second valve means operatively connected between said second and third chambers to seal said second chamber from said third chamber so that the fluid trapped in said second chamber exerts a force to reduce the rate of recovery of said piston assembly in moving to said first position.

3,933,387
THERMOFORMED PLASTIC ENERGY ABSORBER FOR VEHICLES

Robert J. Salloum, and Raymond H. Hodges, both of Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 10, 1975, Ser. No. 556,586
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R **4 Claims**



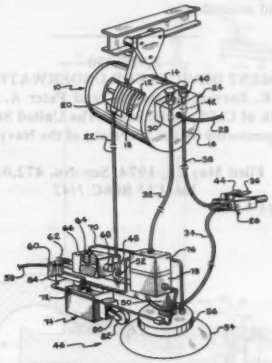
1. A resilient energy absorber operatively mounted on a rigid support of a vehicle comprising a first thin sheet of plastic material, said sheet having a plurality of projections equal in size and spaced a predetermined distance from each other in a plurality of rows to form a first pattern, a second thin wall sheet of plastic material, said second sheet having a plurality of projections equal in size and spaced a predetermined distance from each other in a plurality of rows to form a second pattern, said first sheet being operatively mounted on said second sheet with the projections of said first sheet fitting into the spaces between the projections of said second sheet, each of said projections of said first sheet having contact with the surrounding projections of said second sheet whereby an impact force directed onto said energy absorber deflects said projections of said first and second sheets and said projections flex to absorb the energy of said impact force.

3,933,388
INTERLOCK CONTROL SYSTEM FOR A FLUID-OPERATED HOIST

Stewart J. Conboy, St. Clair Shores, Mich., assignor to D. W. Zimmerman Mfg. Inc., Madison Heights, Mich.

Filed July 17, 1974, Ser. No. 489,391
Int. Cl.² B66C *1/02*
U.S. Cl. 294—64 R **9 Claims**

1. In combination, a fluid-operated hoist including a hoist chamber, a flexible member, and a piston in said chamber for raising and lowering the flexible member in response to pressure of fluid in said chamber, fluid-operated, load-engaging means carried by said flexible member for engaging and disengaging a load, a load-sensing device having a valve with two positions, being in one position when a load is engaged by said load-engaging means and in another position when there is no load engaged by said load-engaging means, means for supplying fluid under pressure to said load-sensing device, a load-sensitive valve, means connecting said load-sensitive valve and said load-sensing device to supply fluid under pressure to said load-sensitive valve when said load-sensing device is in the one position, said load-sensing device and said load-sensitive valve

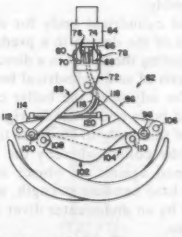


enabling control of fluid under pressure in said hoist chamber when said load-sensing device is in the one position, and a remote controller for controlling the pressure of fluid in said chamber, said load-sensitive valve being in series with said remote controller and said hoist.

3,933,389
GRAPPLE STRUCTURE

Adrian Charles Korbel, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 16, 1974, Ser. No. 515,081
Int. Cl.² B66C *3/16*
U.S. Cl. 294—88 **2 Claims**



1. In a grapple skidder including a wheel-supported frame having a boom means supported thereon, a rotary joint mounted at a free end of the boom means and having a normally downwardly projecting output shaft, a universal connector means pivotally connected to the output shaft and to upper ends of first and second suspension link assemblies of a grapple structure, first and second arcuate grapple tongs having upper end portions respectively pivotally connected to lower ends of said first and second suspension link assemblies for swinging movement about respective first and second axes; first and second cross link assemblies crossing each other midway between and having respective opposite first and second ends respectively pivotally connected to the upper end portions of said first and second grapple tongs, an extensible and retractable hydraulic actuator means coupled between said upper end portions of said first and second tongs and a pair of fluid hoses interconnected between said output shaft of the rotary joint and said hydraulic actuator, the improvement comprising: said respective first ends of the first and second

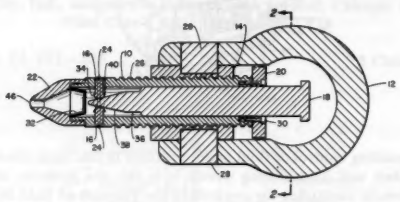
cross link assemblies respectively being connected to the upper end of the first grapple tong at locations equidistant from and on opposite sides of said first axis; and said respective second ends of the first and second cross link assemblies respectively being connected to the upper end of the second grapple tong at locations equidistant from and on opposite sides of said second axis.

3,933,390

ATTACHMENT DEVICES FOR UNDERWATER SALVAGE

Frederick B. Barrett, Camarillo, and Peter A. Nielsen, Ventura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,010
Int. Cl.² B66C *1/42*
U.S. Cl. 294—94 **12 Claims**



1. An attachment device for underwater salvage comprising:

a. an elongated cylindrical body;

b. an external concentric collar adjustably mounted on said body toward one end thereof;

c. a shackle for cable attachments pivotally mounted on said collar, forming a shackle-collar assembly; said shackle being free to rotate on said collar;

d. a plurality of extendable lugs supported in at least one aperture in the opposite end of the body from the shackle-collar assembly;

e. means in said cylindrical body for extending said lugs after insertion of the device in a predrilled hole;

f. means for adjusting the collar in a direction parallel to the longitudinal axis of said cylindrical body;

g. said means for adjusting the collar comprises a helical thread on said body and a handle rigidly attached to the shackle end of said body to facilitate tightening down and retention of the collar, whereby the device may be securely tightened against an object after attachment to increase side load bending strength, and provide ease in manipulation by an underwater diver and a high strength to weight ratio.

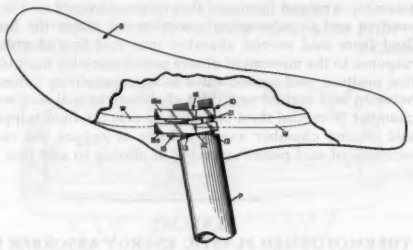
3,933,391

SADDLE SEAT MOUNT WITH SPECIAL SUPPORT POST AND COOPERATING CLAMP ASSEMBLY

William B. Shook, Columbus, Ohio, assignor to Thurston, Inc., Columbus, Ohio

Filed Nov. 11, 1974, Ser. No. 522,860
Int. Cl.² B62J *1/00*; F16B *7/08*
U.S. Cl. 297—195 **9 Claims**

9. A seat mount for a bicycle seat or the like comprising a post having an upper end, a bracket assembly connectable to a bicycle seat and having a lower surface disposed in contacting engagement with and supported on the upper end of said post, one of said lower bracket assembly surface and said upper post end having an angular formation with a transverse vertex line and areas which recede both forwardly and rearwardly of the vertex line and the other having a cooperative surface bearing against said vertex line thereby permitting tilting of said bracket assembly relative to said post, and adjusting bolts connected to said bracket assembly and to the



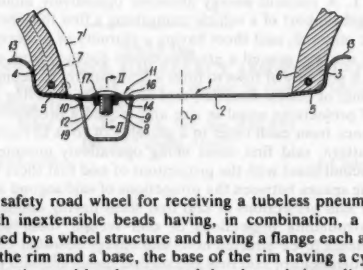
upper end of said post forwardly and rearwardly of the vertex line to tilt the bracket assembly about the vertex line.

3,933,392

WHEEL RIM

William Neil Wells, Melksham, England, assignor to Avon Rubber Company Limited, Melksham, United Kingdom

Continuation of Ser. No. 356,303, May 2, 1973. This application Feb. 18, 1975, Ser. No. 550,281
Claims priority, application United Kingdom, May 2, 1972, 20397/72; Nov. 6, 1972, 51069/72
Int. Cl.² B60B *21/00*
U.S. Cl. 301—98 **16 Claims**



1. A safety road wheel for receiving a tubeless pneumatic tire with inextensible beads having, in combination, a rim supported by a wheel structure and having a flange each axial side of the rim and a base, the base of the rim having a cylindrical portion and bead seats, each bead seat being adjacent a different one of said flanges, the bead seats being adapted to receive and seat beads of a tubeless tire to support loads transmitted between the beads and rim during use, the cylindrical portion of the rim having a well disposed axially between the bead seats and having side walls and a well base, the well being axially adjacent one of the bead seats and spaced from the other bead seat, the side walls extending radially inwardly of the cylindrical portion of the rim towards the well base, the well having a well mouth circumferentially continuous around the rim and being adapted to receive a tire bead during fitting of a tire, removable obstructor for the well, the obstructor including a band to extend circumferentially around the well at least at the mouth thereof and with ends of the band juxtaposed, and coupling means acting between the ends of the band effective for holding them positively together and retaining the band inextensibly and holding the obstructor radially towards the base of the well, the obstructor when so retained denying the tire bead access to any substantial circumferential length of the well, the said retaining means being operable at will to retain or release the said obstructor.

3,933,393

ARRANGEMENT AT CENTRAL INSTALLATIONS FOR PNEUMATIC TRANSPORT OF PACKAGED REFUSE

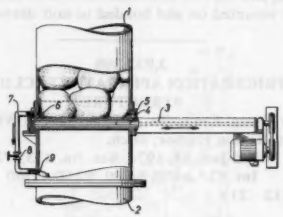
Sergio De Feudis, Nacka, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 4, 1974, Ser. No. 447,839

Claims priority, application Sweden, Mar. 27, 1973, 7304330

Int. Cl.² E04F 17/12

U.S. Cl. 302—27 3 Claims



1. In apparatus for controlling the flow of refuse from a bottom portion of a vertically-extending branch duct to a pneumatic main duct positioned beneath said bottom portion of said branch duct and operated at below atmospheric pressure, comprising a valve positioned between said bottom portion of said branch duct and said main duct, said valve having an upper surface on which said refuse accumulates in said bottom portion of said branch duct when said valve is in its closed position and which permits said refuse to pass through said valve and be sucked away by said pneumatic main duct when said valve is in its open position, said refuse being capable of producing on the upper surface of said valve an accumulation of liquid harmful to the operation of said valve,

the improvement comprising an annular chamber extending about said bottom portion of said branch duct at the level of the upper surface of said valve and having at least one opening providing liquid communication between said annular chamber and the interior of said branch duct at the level of said upper surface of said valve, thereby to collect liquid accumulating at said upper surface of said valve, and means connecting said annular chamber to the interior of said main duct when said valve is closed, so that the suction exerted by said lower-than-atmospheric pressure in said main duct removes said collected liquid from said annular chamber to said main duct to maintain said upper surface of said valve substantially dry.

3,933,394

APPARATUS FOR PNEUMATICALLY WITHDRAWING FINE MATERIAL FROM A SILO CONTAINER

Hans Klein, Beckum; Gerhard Balzau, Neubeckum, both of Germany, and Jacquy-Pierre Laffargue, Paris, France, assignors to Polysius AG, Neubeckum, Germany

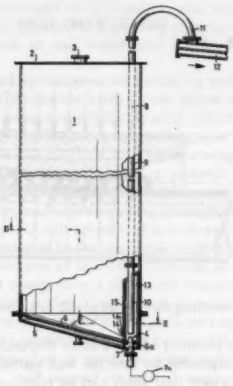
Filed Oct. 4, 1974, Ser. No. 511,735

Claims priority, application Germany, Oct. 13, 1973, 370179[U]

Int. Cl.² B65G 53/40

U.S. Cl. 302—57 11 Claims

1. Apparatus for pneumatically withdrawing fine material from a silo container having a peripheral wall and a base, said base being inclined toward a discharge zone, said apparatus comprising a housing within said container forming a relief chamber at said zone, said housing having apertures adjacent the base of said container to provide an entry for fine material into said chamber; an airfeed nozzle extending into said chamber from below; and a conveyor conduit extending into said chamber from above and having a receiving end in register with and spaced above said nozzle.



3,933,395

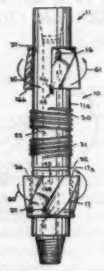
STABILIZER

Ernest G. Evans, Lafayette, La., assignor to Reamco, Inc., Lafayette, La.

Filed Dec. 13, 1973, Ser. No. 424,617

Int. Cl.² F16C 17/00

U.S. Cl. 308—4 A 14 Claims



1. A stabilizer for a tubular string including:

a. a tubular body;

b. sleeve means split transversely to form two sleeve portions for fitting on said body;

c. means for securing said split sleeve means on said body; and

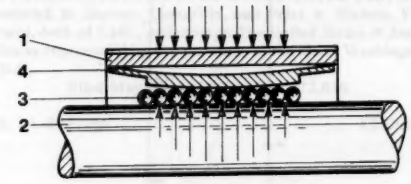
d. said securing means including left and right hand threads on said body and conforming left hand threads on one sleeve portion and right hand threads on the other sleeve portion whereby rotation of said sleeve portions on said body positions said sleeve portions in end to end abutting relationship on said body.

3,933,396

BALL BUSHING

Sven Walter Nilsson, Partille, Sweden, assignor to AB SKF Nova, Goteborg, Sweden

Filed Mar. 11, 1974, Ser. No. 449,783
Claims priority, application Sweden, Apr. 24, 1973, 7305684
Int. Cl.² F16C 31/06
U.S. Cl. 308—6 C 3 Claims



1. A ball bushing device adapted to be mounted on a shaft, comprising:

a. a sleeve element adapted to be disposed around said shaft and comprising an interior wall surface defining a bore within which said shaft can be received;

b. plural balls disposed within said sleeve element and adapted to be maintained adjacent to said shaft; and

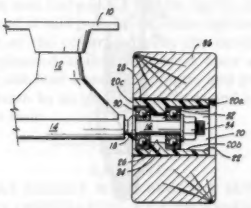
c. a raceway structure located between said balls and said sleeve element, said raceway structure comprising curved elastic plate members having a substantially concavo-convex configuration and comprising a central portion and end portions, the convex surface facing toward said balls and the concave surface facing toward said sleeve element and in an unloaded condition said central portion being disposed closer to said shaft and more remote from said sleeve element than said end portions.

3,933,397

BEARING AND SUPPORT STRUCTURE FOR SPEED RACING ROLLER SKATE

John C. Hood, 4008 S.W. 24th St., Oklahoma City, Okla. 73102

Filed May 22, 1974, Ser. No. 472,488
Int. Cl.² A63C 17/22
U.S. Cl. 308—180 14 Claims



1. An improved bearing and support structure for use in roller skates comprising:

an elongated cylindrical sleeve having a bore of non-uniform diameter extending from one end of the sleeve to the other end thereof;

an annular spacer flange projecting radially inwardly into the bore from the sleeve and spaced axially inwardly in the bore from the opposite ends of the sleeve, said flange partitioning the bore into a first portion of uniform diameter extending from one end of the sleeve to the flange, and a second portion which includes a bearing seat zone of uniform diameter adjacent said flange with the remainder of said second portion extending from said bearing seat zone to the second end of said sleeve and continuously increasing in diameter from said bearing seat zone to said second end of the sleeve;

a skate axle extending into said bore concentrically in the sleeve from said one end at least past said bearing seat zone;

a first bearing disposed in the first portion of said bore adjacent said flange and around said axle between the axle and the sleeve;

a second bearing disposed in the bore at said bearing seat zone and around said axle between the axle and the sleeve; and

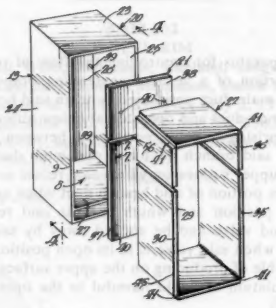
a wheel mounted on and bonded to said sleeve.

3,933,398

REFRIGERATION APPARATUS ENCLOSURE STRUCTURE

Charles W. Haag, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 14, 1974, Ser. No. 433,072
Int. Cl.² A47B 81/00; F25D 11/00
U.S. Cl. 312—214 19 Claims



1. A refrigeration apparatus enclosure structure comprising: an outer cabinet; a preformed inner, laminate wall within said outer cabinet defined by unitary construction of an inner sheet liner having an outer surface bonded to outer insulation confronting said outer cabinet, said insulation having a plurality of preformed openings therethrough, said sheet liner comprising the inner wall element of the enclosure structure; insulative support means secured to said cabinet and extending forwardly therefrom to be received in said openings in said insulation and terminate at said outer surface of said sheet liner, the laminate wall being positioned in preselected relationship to said outer cabinet by the disposition of said support means in said preformed openings whereby the sheet liner is fully spaced from said outer cabinet; and securing means securing said sheet liner to said support means for securing said sheet liner in preselected positioned relationship of said laminate wall with said cabinet wall whereby said sheet liner is in thermally insulated relationship to said cabinet.

3,933,399

DISPLAY STAND FOR ARTICLES OF MERCHANDISE

Joel Robert Kolbensvik, Dallas, and Carole Oman Greene, McKinney, both of Tex., assignors to Application Calculators Incorporated, Dallas, Tex.

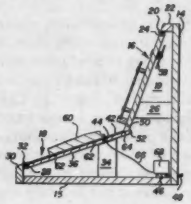
Filed Apr. 30, 1974, Ser. No. 465,691
Int. Cl.² A47B 13/08
U.S. Cl. 312—223 7 Claims

1. A display stand for merchandise which prospective customers may be expected to operate in order to test the suitability of the merchandise, the display stand comprising:

a housing having a display shelf which forms part of the housing and is so oriented that merchandise may be displayed upon the top surface of the shelf;

means for mounting the display shelf to the housing to permit the shelf to be moved between a first position which permits access to the bottom surface of the shelf and a second position in which the bottom surface of the shelf is inaccessible,

securing means adapted to temporarily affix the merchandise to the display shelf so that a prospective customer has physical access to the merchandise, which securing means is positioned beneath the top surface of said shelf and is accessible when said shelf is in the first position and



cannot be removed by the prospective customer when the display shelf is in the second position to prevent removal of the merchandise from the shelf by the prospective customer,

said display shelf comprising:

a base;

a panel to which said articles of merchandise may be mounted; and

means for attaching said panel to said base which permits said panel to be removed from said base when said display shelf is in said first position to permit attachment of the articles of merchandise to the panel and returned to and securely attached to the base after attachment of the article of merchandise to the panel.

3,933,400

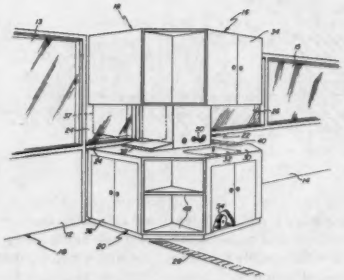
REVOLVING KITCHEN PACKAGE

Peter L. Helgeson, Macungie, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed May 30, 1974, Ser. No. 474,834

Int. Cl.² A47B *49/00, 77/06, 77/08;* E04B *1/346*

U.S. Cl. 312—223 **2 Claims**



1. A kitchen package adapted for movable mounting within a wall comprising a group of selected appliances and conveniences assembled into a unit, means for rotating said unit about a vertical axis to locate selected ones of said appliances and conveniences in predetermined position with respect to said wall, one of said conveniences comprising a water-utilizing device having a water inlet and a drain, and coupling means comprising a first fixed member mounted on said support for connection to external drainage means and source of water, and a second member mounted on said unit for rotation therewith and connected in rotatable water-tight relation to said first member, said second member being connected to said drain and water inlet of said device, said coupling members having therein separate cooperating compartment means for conveying fluids to said water inlet and separately from said drain.

2. A kitchen package adapted for mounting within an opening in a wall and for rotation upon a base within said opening about a vertical axis, comprising spaced upper and lower groups of selected appliances and conveniences arranged in circular fashion around said axis, said groups being of substantially equal outside diametric size, a pedestal section of smaller diametric size interconnecting said groups and forming a unit therewith, said axis extending through said pedestal, means for rotating said unit about said axis on said base, water control elements located in said pedestal section for cooperative use with at least one of said conveniences, at least one of said conveniences comprising a drain and coupling means in said base comprising a first fixed member mounted on said base for connection to external drainage means and source of water, and a second member mounted on the unit for rotation therewith and connected in rotatable water-tight relation to said first member, said second member being connected to said drain of the device and to said water control elements in said pedestal section, said coupling members having separate cooperating compartment means therein for conveying water to said water control elements and for separately conveying fluids from said drain.

3,933,401

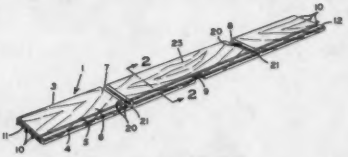
FOAMED POLY(VINYL CHLORIDE) DRAWER SIDES

John G. Lampe, and Willie E. Wall, both of Thomasville, N.C., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 127,258, March 23, 1971. This application June 21, 1974, Ser. No. 481,699

Int. Cl.² A47B *47/04, 88/00, 96/20;* B32B *7/02*

U.S. Cl. 312—330 SM **4 Claims**



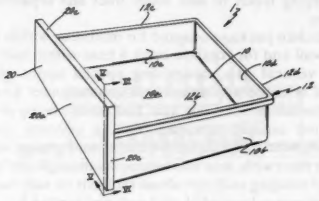
1. A drawer comprising two side walls, an integral rear wall, a bottom and a front, said side walls and rear wall characterized in that they are made of one continuous foamed thermoplastic slab having a dense reinforcing core and a densified skin on the planar surfaces, said dense reinforcing core is centrally located and consists of consolidated portions of the foamed thermoplastic slab material, said resulting slab structure thereby being a three-part structure having a first densified core, secondly, a layer of foam material surrounding said core forming an annulus around the core, and a third part consisting of a densified skin substantially surrounding the densified core and foam material layer, said densified skin surfaces having a simulated wood grain, drawer bottom receiving means on the inner surfaces of said side walls and rear wall, bendable rear corner forming means joining said side walls and rear wall and spaced apart a distance equal to the length of the rear wall, a drawer bottom panel positioned in said bottom panel receiving means, drawer front fastening means on the end of said side walls, and a drawer front fastened to said ends of said side walls.

3,933,402

DRAWER WITH REMOVABLE FRONT PANEL

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed July 15, 1974, Ser. No. 488,507
Int. Cl.[2] A47B 88/00
U.S. Cl. 312—330 13 Claims



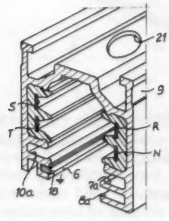
1. A drawer with a removable front panel comprising:
a drawer pan having mounting means for mounting a panel on the front thereof;
a front panel removably secured on said drawer pan; and
fastening means attached to the back side of said drawer panel and invisible from the front side of said panel, said fastening means including a plate member secured to said panel and a latch member mounted on and movable with respect to said plate member and slidably engaging said mounting means for removably securing said panel to said pan; and gripping means positioned to be invisible from the front of said drawer for moving said latch member into engagement with said mounting means to secure said front panel on said drawer pan.

3,933,403

ADAPTOR FOR FEEDING CURRENT TO ELECTRICAL CONTACT RAILS

Erich Rubesamen, Slavertrift 32, and Karl Wehling, Liegnitzer Str. 9, both of 492 Lemgo, Germany

Filed Apr. 15, 1974, Ser. No. 461,179
Claims priority, application Germany, Apr. 26, 1973, 2320983
Int. Cl.[2] H01R 13/60, 9/12
U.S. Cl. 339—22 R 16 Claims



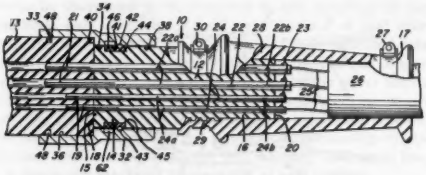
1. An adaptor for insertion into a power distribution rail to feed current into the rail wherein the rail is of the type comprising an openbottomed channel-shaped metallic section having a top positioned opposite said open bottom and having a pair of spaced sides extending downwardly from said top, each of said rail sides including a plurality of webs which are longitudinally spaced from one another to define elongated ducts along the opposing interior sides of the rail having elongated conductors supported therein in electrically insulated relation to the rail for electrical contact with said adaptor and to further define elongated channels along the opposing sides of the rail spaced from the ducts and adapted to receive supporting clips comprising a portion of said adaptor, each web on one side of the rail extending toward a corresponding web on the other side of the rail with the facing edges of each pair of corresponding webs being laterally spaced from one another to define an open region extending along the vertical center line of the rail into which said adaptor may be inserted from the open bottom of said rail, the top of said rail having an aperture therein, said adaptor including a plurality of outwardly extending electrical contacts respectively connected to electrical conductors extending upwardly from said contacts for passage through said aperture in the top of said rail when said adaptor is inserted into the open bottom of said rail, said adaptor comprising a support portion having said supporting clips adjacent thereto, the exterior of said support portion being dimensioned to permit said adaptor to be inserted into the open region of the rail from the bottom of the rail below said aperture in the top of said rail in a predetermined orientation relative to the rail and being shaped to permit said inserted adaptor thereafter to be rotated through a limited angle between the laterally spaced facing edges of the pairs of corresponding webs to turn said supporting clips into the rail channels and to effect electrical contact between said adaptor contacts and the rail conductors, said support portion exterior comprising a pair of diametrically opposed cylindrical segments spaced from one another by a diametrical distance less than the distance between the laterally spaced facing edges of the webs in the rail, the opposing ends of each cylindrical segment merging into a pair of flat planar sections, the flat planar section extending from each end of one of said segments intersecting a flat planar section extending from one end of the other of said segments whereby said intersecting planar sections define a pair of spaced, substantially parallel edges located respectively between the opposing ends of said pair of cylindrical segments, the distance between said pair of edges being greater than the distance between the laterally spaced facing edges of the webs in the rail, and means adjacent the lowermost end of said adaptor for rotating said adaptor through said limited angle after said adaptor has been inserted into the bottom of said rail with its electrical conductors passing from said inserted adaptor to the exterior of the rail via said aperture in the top of said rail.

3,933,404

STRAIN LIMITING MECHANISM

A. Dean Oehlerking, Mitchell, S. Dak., and Charles G. Stoner, New Philadelphia, Ohio, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed July 3, 1974, Ser. No. 485,340
Int. Cl.[2] H01R 13/54
U.S. Cl. 339—45 M 12 Claims



11. An electrical connector portion comprising: a unitary insulating body member; at least one elongated contact assembly carried by said body member and extending along an axis; said contact assembly including first and second contact portions spaced along said axis a first predetermined distance from each other and an intermediate contact portion; the length of said intermediate contact portion spanning said first distance to provide electrical communication between said first and second contact portions; said body member being deformable to increase the dimension thereof in the direction of said axis upon a tensile force acting on said body member in a direction parallel to said axis; said first and second contact

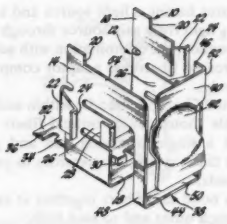
portions being separated from each other a second distance greater than said first distance upon said tensile force acting with a predetermined minimum magnitude on said body member; the maximum length of said intermediate contact portion being less than said second distance to interrupt electrical communication between said first and second contact portions upon said force reaching said predetermined minimum magnitude.

3,933,405

ELECTRICAL CONNECTOR WITH DEFLECTABLE BUTT CONTACT TERMINAL

Charles A. Patterson, Jr., McDonald, and Emil J. Tolnar, Jr., Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 16, 1974, Ser. No. 470,440
Int. Cl.² H01R *25/00*
U.S. Cl. 339—48 **1 Claim**



1. An electrical connector with a deflectable butt contact terminal portion comprising:

a unitary sheet metal stamping having a generally U-shaped mounting portion having substantially parallel leg portions and an interconnecting portion having a stop tab, each of said parallel leg portions having spring arms carrying latch shoulders and resilient wings whereby said connector is adapted to be snap mounted in a hole extending through a support panel and secured thereto by engagement with portions of the panel adjacent the hole and on opposite sides thereof,

a generally U-shaped channel portion having a frontal area no greater than the frontal area of said mounting portion, said generally U-shaped channel portion further having first and second leg portions of equal length which are spaced from each other and substantially parallel, said leg portions having first and second end portions respectively at the free ends thereof,

a web connecting said first end portion to said mounting portion, said web and said first end portion and a portion of one of said leg portions of said mounting portion being contiguous and substantially coplanar,

a plate-like butt contact terminal portion disposed in a substantially perpendicular relationship to said second end portion and having a frontal area no greater than the frontal area of said mounting portion, said plate-like butt contact terminal portion having a central dished portion adapted to engage a rounded end of a stud terminal, and

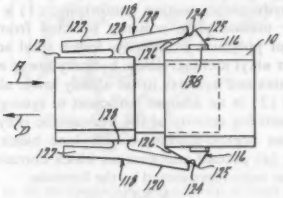
a bight portion constituting the sole means connecting said plate-like butt contact terminal portion to said second end portion whereby said terminal portion is deflectable toward said mounting portion and universally center on the rounded end of a stud terminal located at various distances from the mounting portion due to manufacturing variations by the resilient twisting of said channel portion.

3,933,406

ELECTRICAL CONNECTOR BLOCK ASSEMBLY HAVING OVERCENTER LOCKING

John M. Cameron, Tempe, Ariz., and Robert D. Kennedy, Northville, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,971
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **6 Claims**



1. In combination with a pair of matable electrical connector block members, easily releasible overcenter locking means comprising:

first and second locking lever arm members attached to one member of the matable pair, each of said lever arm members having a forwardly extending portion and a rearwardly extending portion, each of the forwardly extending portions terminating in a transverse portion, said transverse portions being arranged to extend toward each other and to be in closely spaced relation to each other;

means forming a deformable pivot connection between each of the first and second locking lever arm members and the one member of the matable pair, each pivot connection being at least slightly deformable about one axis, each of said at least one axis of each pivot connection being arranged to be generally perpendicular to the plane formed by the two forwardly extending lever arm portions; and

a double ramp member formed on the other member of the matable pair and having first and second ramp surfaces, said double ramp member being positioned on said other member of the matable pair as to be intermediate said forwardly extending lever arm portions, said transverse portions and said pivot connections when the matable pair of connector block members are in fully assembled relation;

each transverse portion including a cooperative surface for cooperating with the double ramp member first surface to deflect the forwardly extending portions in the direction of said one pivot axis and for cooperating with the double ramp member second surface to apply energy stored in said forwardly extending lever arm portions by their deflection to apply an additive force to urge the matable pair of connector blocks together;

said rearwardly extending lever arm portions operative to forcibly rotate said first and second locking lever arm members about said one pivot axis to cause said transverse portions to be rotated apart whereby the cooperation of the forwardly extending lever arm portions and the second surface of the double ramp member in generating a force to urge the matable pair of connector block members together may be avoided during intentional disassembly.

3,933,407

ARTICLES COATED WITH SYNERGISTIC ANTI-FOG COATINGS BASED ON HYDROPHILLIC POLYMERS AND ORGANOSILOXANE- OXYALKYLENE BLOCK COPOLYMERS

Robert S. Tu, 18 University Road, East Brunswick, N.J. 08816, and John J. Shields, 13 Trenton Ave., Edison, N.J. 08817

Filed June 28, 1973, Ser. No. 374,784
Claims priority, application United Kingdom, June 29, 1972, 30612/72
Int. Cl.² G02B 1/10; B32B 17/10, 27/06, 27/08
U.S. Cl. 350—61 14 Claims

1. A normally fogging transparent or reflecting substrate having on at least one surface thereof a non-fogging water insoluble hydrophilic coating comprising: (1) a hydrophilic acrylate or methacrylate polymer selected from the group consisting of polymers of hydroxy lower alkyl acrylates, hydroxy lower alkyl methacrylates, hydroxy lower alkoxy lower alkyl acrylates and hydroxy lower alkoxy lower alkyl methacrylates and (2) in an amount sufficient to synergistically improve the anti-fog activity of the hydrophilic polymeric compound of an organo-siloxane-oxyalkylene block copolymer comprising (a) at least one siloxane block containing at least two siloxane units represented by the formula:

$$R_bSiO_{(4-b)}/2$$

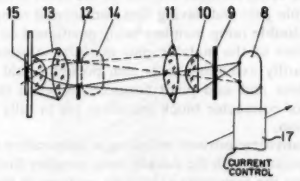
whrein R contains from one to about 20 carbon atoms and is selected from the group consisting of monovalent hydrocarbon groups, halogen-substituted monovalent hydrocarbon groups, and divalent hydrocarbon groups and b has a value from 1 to 3 inclusive, said siloxane block containing at least one of said siloxane units wherein at least one R group is a divalent hydrocarbon group, and (b) at least one oxyalkylene block containing at least four oxyalkylene groups represented by the formula—R′O—, wherein R′ is an alkylene group containing from two to about 10 carbon atoms, said siloxane oxyalkylene blocks being interconnected by said divalent hydrocarbon group.

3,933,408

MICROSCOPE-ILLUMINATING SYSTEM

Guido Georg Reinert, Allgauer Strasse 103, D-8000 Munich 71, Germany

Filed Mar. 6, 1974, Ser. No. 448,737
Claims priority, application Austria, Mar. 6, 1973, 1977/73
Int. Cl.² G02B 21/08
U.S. Cl. 350—87 4 Claims



1. An illuminating system for a microscope provided with an objective, comprising:

a fluorescent lamp remote from said objective;

a field-control diaphragm proximal to said lamp and an aperture-control diaphragm remote from said lamp disposed along the objective axis between said objective and said lamp; and

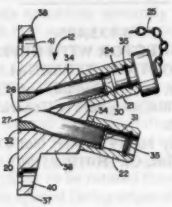
collective lens means between said diaphragms producing an aerial image of said lamp immediately ahead of said aperture-control diaphragm while focusing said field-control diaphragm at infinity whereby an image of said field-control diaphragm is formed at a focal plane of said objective illuminated by rays from said aerial image.

3,933,409

BIFURCATED FIBEROPTIC ADAPTORS

Jacobus Kloots, Sturbridge, Mass., assignor to Applied Fiberoptics, Inc., Southbridge, Mass.

Filed Oct. 7, 1974, Ser. No. 512,626
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 B 5 Claims



1. In apparatus having a light source and an outlet connection, for piping light from said source through light conductors to a remote location, the combination with said outlet connection of a bifurcated fiberoptic adaptor comprising:

a. a rigid body;

b. a bifurcated fiberoptic bundle within said body consisting of multiple thousands of optical fibers all gathered together at a single receiving end and gathered in two groups at their opposite extremities to provide two transmitting ends;

c. means to bond said fibers together at said receiving end both to each other and to said body;

d. means to bond said fibers together in two groups at said transmitting ends both to each other and to said body;

e. means integral with said body for mating said receiving end to said light source; and,

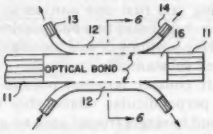
f. means integral with said body for mating said transmitting ends to flexible fiberoptic cables, all for dividing the light along two separate paths to be piped to two separate locations.

3,933,410

OPTICAL CONNECTOR WITH SINGLE SCRAMBLING VOLUME

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,537
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C 4 Claims



1. An optical connector for connecting two sections of a main fiber optic bundle transmission line together and for coupling radiation into and out of the main transmission line; which comprises:

a main optical transmission dielectric rod having ends with a cross sectional area equal to said main transmission lines;

said dielectric rod including at least one side with a flat surface along a portion of the length thereof;

an auxiliary dielectric rod having the same index of refraction as said main dielectric rod;

said auxiliary dielectric rod including a flat side surface and joined with said main dielectric rod along its flat surface in optical alignment therewith;

whereby said main dielectric rod may be optically connected to said main radiation transmission line and said auxiliary rod may be connected with auxiliary fiber optic bundles.

3,933,411
HYDROPHILIC CONTACT LENS WITH EMBEDDED STABILIZING MEANS

Albert E. Winner, 67 E. Madison St., Chicago, Ill. 60603

Filed July 23, 1971, Ser. No. 165,662
Int. Cl.² G02C 7/04
U.S. Cl. 351—160 **4 Claims**

1. An improved contact lens made of hydrophilic plastic material which is adapted generally to orient itself in a manner corresponding with the eye contour and surface on which it rests, the improvement comprising:

a contact lens body having a central optical area corresponding generally to the maximum pupil opening of the eye and an outer peripheral area in surrounding relationship with said optical area;

means embedded wholly within said lens body and positioned radially beyond said central optical area for stabilizing the anterior portion of said central optical area against re-orientation in a manner corresponding to the eye contour, whereby the optical characteristics originally provided in said optical area is retained during reorientation of the lens body; and

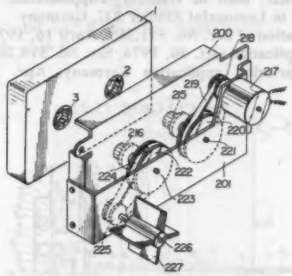
an inwardly beveled surface on the posterior outermost radial edge of said peripheral area.

3,933,412
PROCESSING SYSTEM UTILIZING A MULTI-PURPOSE FILM HANDLING CARTRIDGE

Kazuya Hosoe, Machida, and Yoshio Komine, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed May 29, 1974, Ser. No. 474,155
Claims priority, application Japan, May 31, 1973, 48-61689; May 31, 1973, 48-61679; May 31, 1973, 48-61680
Int. Cl.² G03C 11/00
U.S. Cl. 352—130 **28 Claims**

1. A film handling system capable of using a film cartridge comprising a film cartridge accommodating a strip of film therewithin and adapted to be utilized commonly in each process for exposure, development as well as projection of the film, said cartridge comprising a housing, a first reel means disposed within said housing for entwining a strip of film therearound at a predetermined position, a second reel means disposed within said housing for taking up said strip of film taken out from said first reel means, a means disposed within said housing for storing developer to develop said film, said means being provided with an opening wherefrom said developer is adapted to impinge selectively on the film path of said strip of film, an apparatus capable of effecting at least said development process for the film accommodated within said film cartridge, said apparatus comprising driving means for actuating said apparatus, said driving means being adapted to provide a driving force of nearly constant speed at all times, a film cartridge chamber for accommodating therewithin said film cartridge at a predetermined position, a film strip advance means for transporting said film in said film cartridge disposed within said film cartridge chamber, said means being arranged

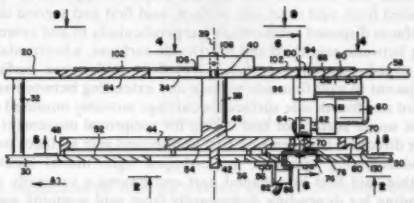


selectively to be mechanically linked with at least said second reel means and being actuated by the driving force of said driving means, a mechanical transducer means for decelerating the rotational speed of said film strip advance means with respect to the rotational speed of said driving means at a predetermined ratio corresponding to the amount of film taken around said second reel means, whereby the travelling speed of the film is substantially made constant when the film accommodated within said film cartridge is subjected to at least the development process.

3,933,413
DRIVE MECHANISM FOR A SPIRAL ARRAY OF INDIVIDUAL FILM PHOTOGRAPHS

Ralph A. Sickles, 1418 E. Steamboat Bend, Tempe, Ariz. 85253

Filed Mar. 22, 1974, Ser. No. 453,725
Int. Cl.² G03B 23/10, 25/00
U.S. Cl. 353—110 **20 Claims**



1. In a drive mechanism for a spiral array of individual film photographs wherein the spiral array of individual photographs are carried by a photograph mount, the combination of: a frame; a rotary driving plate movably mounted on said frame; a photograph mount having a spiral array of individual translucent photographs; means coupling said rotary driving plate and said photograph mount and adapted to rotatably drive said photograph mount; said rotary driving plate having a spiral array of switch operating portions; each of said switch operating portions disposed in corresponding relationship to one of said translucent photographs; a stationary switch mounted on said frame and disposed to be intermittently and successively actuated by said switch operating portions of said rotary driving plate; a power operated means mounted on said frame and coupled to said switch and adapted to be intermittently energized by said switch; a pall driven by said power operated means; a spiral array of pall engaging portions carried by said rotary driving plate and disposed to be individually engaged by said pall for rotating said rotary driving plate;

said pall engaging portions each disposed and corresponding with one of said photographs and corresponding ones of said switch operating portions (portion).

3,933,414

ELECTROSTATIC COPYING MACHINE

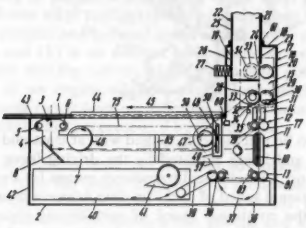
Walter Limberger, deceased, late of Hamburg-Poppenbuttel, Germany; by Jurgen Limberger, heir, and by Ursula Limberger, heir, both of Hamburg-Poppenbuttel, Germany, assignors to Lumoprint Zindler KG, Germany

Continuation of Ser. No. 351,289, April 16, 1973. This application Oct. 30, 1974, Ser. No. 519,262

Claims priority, application Germany, Apr. 19, 1972, 2218977

Int. Cl.[2] G03G *15/22*

U.S. Cl. 355—3 R **3 Claims**



1. An electrostatic copying machine in which an image is transferred from an original to a copy sheet, comprising an L-shaped machine casing including a first box-shaped part having longitudinally extending horizontally arranged upper and lower surfaces, a second box-shaped part extending vertically upwardly from one end of the upper surface of said first box-shaped part, said first box-shaped part including side surfaces extending vertically between said upper and lower surfaces and consisting of a first side surface, a second side surface located at the end of said first box-shaped part from which said second box-shaped part extends and disposed opposite to and spaced from said first side surface, a third side surface and a fourth side surface disposed opposite to and spaced from said third side surface, said first and second side surfaces disposed substantially perpendicularly to and extending between said third and fourth side surfaces, a horizontally arranged scanning aperture located in said upper surface adjacent to said first side surface and extending between said third and fourth side surfaces, a carriage movably mounted on said upper surface of said casing for reciprocal movement in the direction between said first and second side surfaces over said scanning aperture, an L-shaped light tunnel located within said first box-shaped part and having a vertically extending leg depending downwardly from said scanning aperture in said upper surface and a horizontally extending leg extending from the lower end of said vertical leg toward said second side surface and being in parallel relation therewith and spaced between and from said upper and lower surfaces, an optical reflector located at the junction of the vertical and horizontal legs of said light tunnel, the end of said horizontally extending leg of said light tunnel remote from said reflector aligned vertically below said second box-shaped part and forming an exposure station arranged to receive light rays from said reflector, said second box-shaped part located on the opposite side of said scanning aperture from said first side surface, said second box-shaped part forming an upward extension of the interior of said first box-shaped part from the upper surface of said first box-shaped part, said second box-shaped part having a downwardly extending recess in its upper horizontally arranged end, said second box-shaped part comprising two pair of vertically extending sides with one side of one said pair aligned with said second side surface and with one side of the other said pair aligned with said third side surface and the other side of the other said pair aligned with said fourth side surface, means defining an L-shaped path forming the complete path for the copy sheets through said machine casing, said L-shaped path comprising a vertical leg and a horizontal leg with said vertical leg extending substantially parallel to said vertical leg of said light tunnel and located at the opposite end of said machine casing adjacent said second side surface, said vertical leg of said L-shaped path extending downwardly from the lower end of said recess said second box-shaped part into said first box-shaped part to adjacent and above the lower surface of said first box-shaped part, said vertical leg of said L-shaped path intersecting the exposure station at the end of said horizontal leg of said L-shaped light tunnel, said horizontal leg of said L-shaped path connected to the lower end of said vertical leg and extending therefrom through said first box-shaped part toward said first side surface below and in generally parallel relation with said horizontal leg of said light tunnel, a developing unit positioned within said first box-shaped part and located in said horizontal leg of said L-shaped path at its junction with said vertical leg of said L-shaped path and said developing unit including a curved guide arranged to deflect copy sheets from a vertical to a horizontal orientation as they pass along said L-shaped path, a drying fan located in the horizontal leg of said L-shaped path and spaced from said developing unit toward said first side surface, a cassette-type stack holder arranged to hold copy sheets, said stack holder being removably insertable in the vertical direction into the recess in the upper end of said second box-shaped part with said stack holder extending vertically and arranged to position the copy sheets vertically for passage vertically downward directly into the upper end of the vertical leg of said L-shaped path, said cassette-type stack holder extending upwardly from the upper end of said second box-shaped part, means in the upper end of said vertical leg of said L-shaped path for removing individual copy sheets from said cassette-type stack holder and for passing them downwardly through the vertical leg of said L-shaped path, and an electrostatic charging device positioned in said vertical leg of said L-shaped path in advance of the position at which said vertical leg of said L-shaped path intersects the exposure station in said L-shaped light tunnel, said means for removing individual copy sheets and for passing them downwardly comprises a withdrawal roller located in said second box-shaped part at the lower end of said recess therein for removing individual copy sheets from said stack holder and three pairs of rollers spaced vertically and positioned in said L-shaped path for moving a copy sheet vertically downwardly within said casing with a first one of said pairs located between said withdrawal roller and said electrostatic charging device, a second one of said pairs located between said electrostatic charging device and said exposure station and a third one of said pairs located between said exposure station and said developing unit, said copying machine providing a compact and space saving device by the correlated L-shaped arrangements of said casing, said light tunnel and said path of the copy sheets.

3,933,415

PAINTING SYSTEM

John C. Woolpert, 1717 Ala Wai Blvd., Honolulu, Hawaii 96815

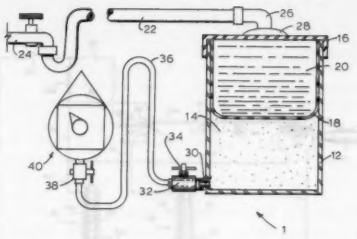
Filed May 11, 1973, Ser. No. 359,340

Int. Cl.[2] B05D *1/28*

U.S. Cl. 401—145 **14 Claims**

1. A paint applying system comprising an upright paint container having a base wall and an upright wall connected to the base wall and extending upward therefrom, paint disposed in the container in contact with the base wall and the upright wall, a flexible wall in engagement with the paint in the container, a water pressure source means for continuously applying water pressure to the flexible wall in a direction to extend the flexible wall toward the paint within the container, an opening in the upright wall near the base wall of the container

for flowing paint out of the container through the opening upon pressurizing of the paint by extension of the flexible wall toward the paint, valve means connected adjacent to the opening externally of the container for controlling the flow of paint outward through the opening and through the valve means, and paint conducting means having a proximal end connected to the valve means for conducting paint outward



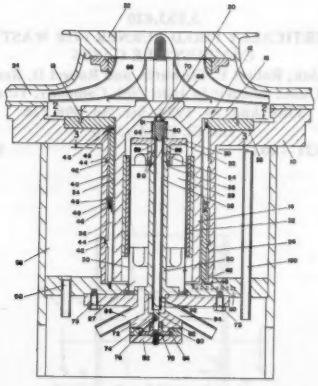
from the valve means, and paint applying means connected to a distal end of the conducting means for receiving and distributing paint flowing to the paint applying means from the conducting means, the paint applying means including a second valve connected to the distal end of the paint conducting means for controlling flow of paint from the paint conducting means to the paint applying means.

3,933,416

HERMETICALLY SEALED MOTOR BLOWER UNIT WITH STATOR INSIDE HOLLOW ARMATURE

Khatchik O. Donelian, New York, N.Y., assignor to United States Energy Research & Development Administration, Washington, D.C.

Filed May 1, 1945, Ser. No. 591,240
Int. Cl.² F04B *35/04*
U.S. Cl. 417—354 **13 Claims**



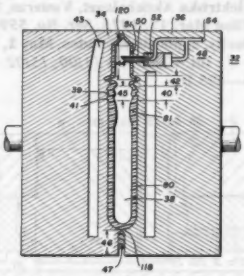
1. An electric motor comprising, in combination, a hollow rotor having an external bearing surface, a motor-stator located within said hollow rotor, a plurality of tiltable bearing shoes having bearing surfaces confronting the external bearing surface of said rotor and adapted to cooperate therewith to support the radial thrust of said rotor, said bearing shoes being radially opposite at least a part of said motor-stator and a motor-rotor mounted on said rotor in operative relationship with respect to said motor-stator, said motor-rotor and said motor-stator cooperating to rotate said rotor.

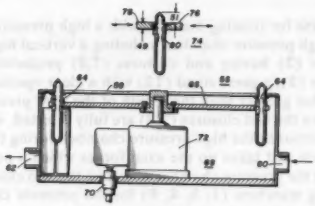
3,933,417

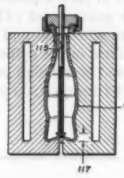
APPARATUS FOR FORMING MULTIAXIALLY ORIENTED CONTAINERS

Joseph R. Reilly, Naugatuck, and Thomas F. Sincock, Simsbury, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 336,023, Feb. 26, 1973, which is a division of Ser. No. 148,544, June 1, 1971, now Defensive Publication No. 3,754,851. This application June 5, 1974, Ser. No. 476,656
Int. Cl.² B29C *5/06;* **B29D** *23/03*
U.S. Cl. 425—326 B **6 Claims**







1. Apparatus for forming biaxially oriented containers comprising:

a. surface means for forming a parison;

b. a conditioning mold downstream of said surface means, said conditioning mold having an internal cavity smaller in surface area than that of said container, said conditioning mold including cooling means for regulating the surface temperature of the wall of said internal cavity;

c. a finishing mold downstream of the conditioning mold, said finishing mold having an internal cavity configuration conforming to that of the container and having cooling means for regulating the surface temperature of the wall of the cavity of said finishing mold;

d. first means for expanding the parison in the conditioning mold to form a preform;

e. means for longitudinally stretching the preform subsequent to expansion in the conditioning mold and prior to expansion in the finishing mold;

f. temperature conditioning means separate from said conditioning mold and finishing mold for bringing the temperature of the preform to within the range at which

substantial molecular orientation occurs on stretching; and

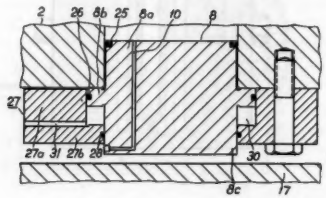
g. second means distinct from said first means for expanding the preform in the finishing mold.

3,933,418

PRESS FOR TREATING PRODUCTS UNDER HIGH PRESSURE

Staffan Elmgren, Helsingborg, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 17, 1975, Ser. No. 559,050
Claims priority, application Sweden, May 2, 1974, 7405837
Int. Cl.[2] B30B *11/00, 15/02*
U.S. Cl. 425—405 H **3 Claims**



1. Press for treating material with a high pressure, comprising a high pressure chamber including a vertical high pressure cylinder (**2**) having end closures (**7,8**) projecting into the cylinder (**2**), a press stand (**12**) with a clear opening which is somewhat greater than the length of the high pressure chamber when the end closures (**7,8**) are fully inserted, which stand (**12**) surrounds the high pressure chamber during the pressing operation and takes up the axial forces which a pressure medium in the pressure chamber exerts on the end closures (**7,8**), carrying members (**1, 3, 4, 5**) for the pressure chamber for holding said chamber in such a position that gaps (**21,22**) are formed between the press stand (**12**) and the end closures (**7,8**) of the chamber when the end closures are inserted to their innermost positions in the cylinder, in which a ring (**27**) is connected to one end of the high pressure chamber and one of the end closures (**8**) comprises a piston slidable within said ring.

3,933,419

MAGNETICALLY-CONTROLLED GAS IGNITION SYSTEM

Pat Romanelli, Harrington Park, N.J., assignor to Ram Domestic Products Company, Northvale, N.J.

Filed Nov. 20, 1974, Ser. No. 525,397
Int. Cl.[2] F23N *5/00*
U.S. Cl. 431—66 **9 Claims**

1. An automatic fuel ignition and detection system for gas fired devices having a source of electrical power, a burner provided with an outlet, and a fuel valve for controlling the flow of gas into said burner,

said system comprising an electrical ignition element connected to said source of electrical power and located in proximity to said burner outlet for igniting gas flowing thereto when said ignition element is energized and brought to a gas ignition temperature,

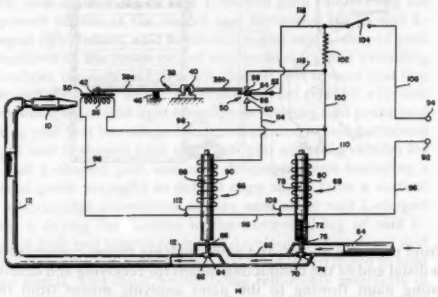
a heat-sensing element mounted adjacent to said ignition element in a position to receive the heat therefrom,

said heat-sensing element being normally magnetically attractable and having a Curie temperature at least as high as said gas ignition temperature at which it loses its magnetic attractability,

a permanent magnet positioned to be attracted to and engaged by said heat-sensing element when the temperature of the latter is below its Curie temperature, said magnet being released by said heat-sensing element when the latter is heated to its Curie temperature,

biasing means urging said magnet in a direction away from said heat-sensing element,

and means operatively connecting said magnet to said fuel



valve for closing said fuel valve when said magnet is in engagement with said heat-sensing element, and opening said fuel valve when said magnet is released by said heat-sensing element and moved out of engagement therewith by said biasing means,

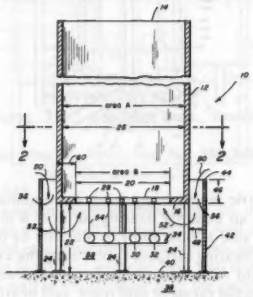
whereby gas is fed through said burner only after said ignition element has been heated to said gas ignition temperature.

3,933,420

VERTICALLY FIRED BURNER FOR WASTE COMBUSTIBLE GASES

John S. Zink; Robert E. Schwartz, and Robert D. Reed, all of Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Aug. 19, 1974, Ser. No. 498,276
Int. Cl. F23d *13/20*
U.S. Cl. 431—202 **9 Claims**



1. A vertically fired furnace for burning combustible waste gases comprising;

a. a cylindrical or polygonal furnace of internal cross-sectional area A, said furnace supported with its axis vertical and with its base a selected distance above the grade surface on which it is supported;
b. plate means partially closing off the bottom of said furnace, said plate means having at least one opening for air and fuel entry;
c. burner means positioned in said at least one opening, in the plane of said plate means, the net cross-sectional area of said at least one opening for the passage of air being B;
d. cylindrical wind baffle means coaxial with the bottom of said furnace, and partially enclosing the space between the bottom of said furnace and the grade surface on which said furnace is supported, the remaining opening for supplying combustion air to said burner means being of area C and positioned at least a selected distance from said burner means; and
e. means to supply combustible gas to said burner means.

3,933,421
POLYMER TREATMENT OF FIBROUS AND FILAMENTARY MATERIALS

David Malcolm Lewis, Otley, England, assignor to I.W.S. Nominee Company Limited, London, England

Filed Dec. 5, 1972, Ser. No. 312,357
Claims priority, application United Kingdom, Dec. 9, 1971, 57313/71; Feb. 7, 1972, 5643/72
Int. Cl.[2] D06P 1/86; D06Q 1/02; D06M 3/06
U.S. Cl. 8—10 36 Claims

1. A process for the treatment of fibrous or filamentary material which comprises applying thereto a polymeric compound comprising:

a. a radical derived by the removal of two or more hydroxyl groups from a polyhydric alcohol;
b. bound to this radical through an oxygen atom at the sites vacated by said hydroxyl groups at least two poly(oxyalkylene) chains; and
c. at least two thiosulfuric acid or thiosulfate groups each bound through a linking group to a chain terminating oxygen atom of said poly(oxyalkylene) chains, said linking group containing from 1 to 10 carbon atoms and being an alkylene, alkylenecarbonyl or hydroxy alkylene group, and curing the compound on the fibres.

3,933,422
NON-STAINING KERATINIC COLORING PRODUCT

Hosny Y. Saad, Berkeley Square, N.Y., assignor to Avon Products, Inc., Suffern, N.Y.

Continuation-in-part of Ser. No. 227,601, Feb. 18, 1972, abandoned, and a continuation-in-part of Ser. No. 712,398, March 12, 1968, abandoned. This application Apr. 25, 1974, Ser. No. 464,036
Int. Cl.[2] A61K 7/13
U.S. Cl. 8—10.1 8 Claims

1. An aqueous hair coloring composition that is non-staining to the skin consisting essentially of:

a. a major amount of water;
b. from about 0.1 to about 10% by weight of a premetallized dye soluble in a compatible organic dye carrier and capable of penetrating keratinic fibers;
c. from about 0.1 to about 10% by weight of a compatible organic dye carrier for coassisting the transfer of said dye into keratinic fibers, said dye carrier selected from the group consisting of:
   1. a benzyl alcohol derivative selected from the group consisting of benzyl alcohols, C_1-C_4 carboxylic acid esterified benzyl alcohol and benzyloxyalkanols;
   2. an alkyl phenone;
   3. an oxygen substituted cyclohexane selected from the group consisting of cyclohexanols and cyclohexanones;
   4. n-nonylaldehyde;
   5. 2-methyl-1-pentanol;
   6. 2-phenoxy-ethanol;
d. from about 0.1 to about 5% by weight of an anionic surface active agent; and
e. from about 0.1 to about 5% by weight of a skin stain inhibiting agent selected from the group consisting of polyoxyalkylene (10 - 80) lanolins, lanolin alchols, lanolin fatty esters and C_8-C_{20} fatty alcohols.

3,933,423
AZOIC DYEING OF LEATHER

Catharine Elizabeth Looney, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1973, Ser. No. 360,584
Int. Cl.[2] D06P 3/12, 3/32, 5/00; G03C 1/52
U.S. Cl. 8—13 17 Claims

1. An improved process for dyeing leather with azoic dyes without significantly changing the surface or bulk esthetic or physical properties of the leather which comprises interacting within leather a diazonium and a coupling component to form a colored dye wherein the improvement consists essentially of (a) incorporating into substantially dry leather simultaneously or sequentially

(1) a diazonium component, and
(2) coupling component as required, in solution in a substantially non-aqueous, volatile, low-viscosity solvent liquid containing less than about 25% water, (b) interacting the diazonium component and a coupling component without wetting the leather with water, and (c) evaporating any remaining solvent liquid from the leather at ambient temperatures.

3,933,424
MODIFIED SULFONATED RESIN SURFACTANTS

Sten I. Falkehag, Mount Pleasant, and Carl W. Bailey, III, Isle of Palms, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 333,995, Feb. 20, 1973, Pat. No. 3,870,681. This application Feb. 25, 1974, Ser. No. 445,536
Int. Cl.[2] C09B 9/00, 49/00; D06P 5/04
U.S. Cl. 8—34 12 Claims

1. A dyestuff composition comprising, a disperse or vat dye cake and from 1 to 75% by weight of a water-soluble dispersant on said dyestuff composition, said water-soluble dispersant being reaction products of sulfomethylated phenolic-formaldehyde resin and 0.25 moles to 20 moles per 1000 grams of said resin of an agent of the type $X(CHR)_m(CH_2)_nY$, wherein X is a halogen, a halohydrin group, an activated double bond or an epoxide group, Y is a sulfonate, carboxylate, phosphonate or hydroxyl, mercaptan, amine or hydrogen, and n and m are integers from 0 to 5 with m and n together being at least 1, to give resin adducts with the phenolic hydroxyl at least partially blocked.

3,933,425
METHOD OF CLEANING TEXTILES

Werner Grünewälder, Haan Rhineland, and Herbert Frotscher, Langenfeld Rhineland, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed June 29, 1973, Ser. No. 375,097
Claims priority, application Germany, July 1, 1972, 2232397
Int. Cl.[2] D06L 1/02
U.S. Cl. 8—142 11 Claims

1. In the method of chemically cleaning and preventing greying of a textile in an organic solvent which comprises contacting a textile with an organic solvent containing cleaning intensifiers and a small quantity of water, said organic solvent being selected from the group consisting of halogenated methane and ethane solvents and aliphatic hydrocarbon solvents, separating said textile from said solvent and recovering said cleaned textile, the improvement which comprises bringing said organic solvent during the cleaning operation into substantially continuous contact with an adsorption material having an insolubly fixed impregnation of a polycondensation product containing polyalkylene glycol units, said polycondensation product containing polyalkylene glycol units being selected from the group consisting of (I) a reaction product of a component (a) selected from the group consist-

ing of water-soluble melamine-formaldehyde condensates and water-soluble urea-glyoxal-formaldehyde condensates with a component (b) selected from the group consisting of polyalkylene oxides and products of addition of alkylene oxides to a compound selected from the group consisting of phenols, fatty alcohols, fatty acids, fatty acid amides, alkylamines, and alkylolamines, (II) a reaction product of a component (a) selected from the group consisting of polyalkylene polyamines, aqueous ammonia and mixtures thereof with a component (b) consisting of alkylene oxide derivatives having 3 to 70 alkylene oxide units and more than one halogenhydrin in the molecule, (III) a reaction product of a component (a) selected from the group consisting of a water-soluble compound having reactive amino groups containing polyalkylene oxide units and water-soluble polyalkylene polyamines containing polyalkylene oxide units reacted with a component (b) selected from the group consisting of epichlorohydrin and compounds having more than one substituent selected from the group consisting of epoxide, halogenhydrin, and the mixtures thereof in the molecule, and (IV) a water-soluble polyvalent amine obtained by condensation of a component (a) selected from the group consisting of polychlorohydrin ethers of polyalkylene oxides and polychlorohydrin ethers of compounds having polyalkylene oxide reacted with a component (b) selected from the group consisting of ammonia and mixtures of ammonia and polyvalent amines, further reacted with a component (c) selected from the group consisting of epichlorohydrin ethers of polyols, dichlorohydrin ethers of polyols, bischlorohydrin ethers of polyols, and the mixtures thereof, said contacting with said adsorption material consisting of passing said organic solvent through a layer of said adsorption material in particulate form.

3,933,426

PROCESS FOR MAKING TEXTILES CONTAINING CELLULOSE CREASE-RESISTANT

Bruno Martini, Rheinfelden, Switzerland; Gunter Pusch, Leitershofen, Germany; Erich Rossler, Leitershofen, Germany, and Dieter Walz, Hainhofen, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 2, 1973, Ser. No. 402,663

Claims priority, application Germany, Oct. 7, 1972, 2249272

Int. Cl.² D06M *13/34*

U.S. Cl. 8—183 **12 Claims**

1. A process for making textile containing cellulose crease-resistant which comprises contacting the textile material with an aqueous finishing solution containing one or more N-methylol or N-methylol ether derivatives of nitrogenous compounds and of which at least 40% by weight based on the weight of the sum of the N-methylol derivatives calculated as anhydrous substances is 1,3-dimethylol-4,5-dihydroxyethylene urea the hydroxyl and methylol groups of which are free or are partially or completely etherified with a monohydric aliphatic alcohol containing 1 to 3 carbon atoms, a potential acid catalyst, and from 1 to 12% by weight based on the weight of the N-methylol derivatives calculated as anhydrous substances of an alkali metal chloride or a bromide of sodium or potassium and drying and subjecting the textile material to a heat treatment.

3,933,427

PROCESS FOR PREVENTING CORROSION AND THE FORMATION OF SCALE IN WATER CIRCULATING SYSTEM

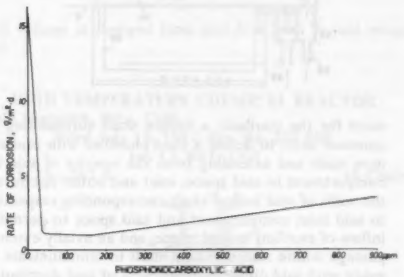
Gerhard Bohnsack, Bergisch-Neukirchen; Hans Geffers; Herbert Kallfass, both of Cologne, and Walter Radt, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 21, 1973, Ser. No. 362,449

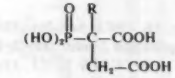
Claims priority, application Germany, May 26, 1972, 2225645

Int. Cl.² C23F *11/10*; C02B *5/06*; C07F *9/02*

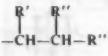
U.S. Cl. 21—2.7 A **6 Claims**



1. A process for preventing corrosion and the formation of scale in a water re-circulating system which comprises adding to each cubic meter of the water being re-circulated from about 5 to 100 grams of a compound selected from the group consisting of those of the formula



and the water-soluble salts thereof, R being hydrogen, alkyl, alkenyl or alkinyl having up to 4 carbon atoms; phenyl; cycloalkyl having 3 to 6 carbon atoms; benzyl; phenethyl or



wherein R′ is hydrogen, alkyl having 1 to 4 carbon atoms or carboxyl, R″ is hydrogen or methyl and R‴ is carboxyl.

3,933,428

DEVICE FOR THE STERILIZATION OF PACKAGING MATERIAL

Hermann Egger, St. Ursen, Switzerland, assignor to Quepar S.A., Fribourg, Switzerland

Filed Dec. 4, 1973, Ser. No. 421,724

Claims priority, application Italy, Dec. 22, 1972, 54978

Int. Cl.² A61L *3/00*; B08B *1/02*

U.S. Cl. 21—93 **2 Claims**

1. A device for the sterilization of packaging material comprising:

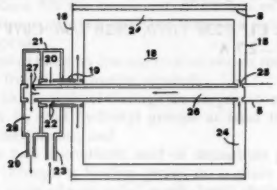
a closed sterilization chamber;

a plurality of drums rotably mounted within said chamber, each of said drums comprises a hollow external cylinder having a permeable cylindrical surface impregnated with a heated sterilant, said hollow external cylinder enclosing a smaller cylinder, both said external cylinder and said smaller cylinder being coaxially and rigidly attached to a common shaft, said hollow cylinder and said smaller cylinder having a space therebetween;

guide means for leading packaging material along said impregnated drum surfaces;

overpressurizing means for keeping an overpressure of sterile air within said sterilization chamber to prevent unsterile external atmosphere from penetrating into the interior of said chamber; and

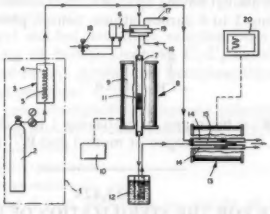
means for circulating the heated sterilant within said space which comprises: a stationary distributor having an inlet compartment having an interior and an outlet compartment for the sterilant; a hollow shaft surrounding said common shaft to define a fluid chamber with said common shaft and extending from the interior of said inlet compartment to said space; inlet and outlet apertures in the walls of said hollow shaft corresponding respectively to said inlet compartment and said space to permit the inflow of sterilant to said space; and an axially extending passage within said common shaft to communicate said space with said outlet compartment of said distributor.



3,933,429
METHOD AND APPARATUS FOR DETERMINING THE TOTAL OXYGEN DEMAND OF COMBUSTIBLE MATERIALS IN AQUEOUS DISPERSION

Yoshiki Shibata; Hideo Kakigami, and Syuzo Takeda, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 26, 1973, Ser. No. 354,643
Claims priority, application Japan, May 2, 1972, 47-43291
Int. Cl.[2] B01K *1/00;* **G01N** *27/52, 31/12, 33/18*
U.S. Cl. 23—230 PC **25 Claims**



1. A method for determining the total oxygen demand of combustible materials in an aqueous dispersion said materials being provided in a feed gas stream, using means forming a combustion zone and a detector for determining differences of concentration of oxygen in comparative samples, having two flow paths, which comprises the following steps:

a. dividing a feed gas stream composed of an inert gas containing oxygen into two parts.

b. supplying a first part of said feed gas stream into said first flow path through said detector for determining differences in the concentration of oxygen, and

c. supplying a second part of said feed gas stream through a combustion conduit in said combustion zone which contains a catalyst bed and is heated to a combustion supporting temperature, wherein said second part of said feed gas stream flows through said combustion supporting catalyst bed in said combustion zone, and

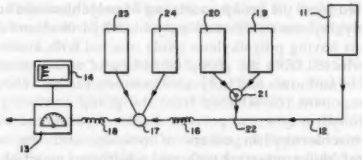
d. thereafter channeling the effluent second part of said feed gas stream from said combustion conduit into said second flow path through said detector, and

e. while continuing the above procedures, injecting a small amount of an aqueous dispersion of combustible materials into said combustion conduit upstream of said catalyst bed, whereby said combustible materials are burned and an electrical signal corresponding to the total oxygen demand for burning said combustible material is generated by said detector.

3,933,430
CONSTANT FLOW SYSTEM FOR DETECTION OF AMINO ACIDS

Peter Edgar Hare, Takoma Park, Md., assignor to Durrum Instrument Corporation, Palo Alto, Calif.

Filed June 25, 1975, Ser. No. 590,216
Int. Cl.[2] G01N *31/08, 21/26*
U.S. Cl. 23—230 R **11 Claims**



1. In a continuous method for avoiding baseline shift in the detection of at least a first and second substance in a known sequence in a liquid sample stream moving in a flow path at a substantially constant flow rate to a detection zone, wherein detectability of said first substance is impeded by reaction with a conversion reagent and detectability of said second substance is improved by reaction with said conversion reagent, the steps of

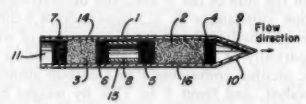
a. adding an inert liquid diluent stream at a predetermined flow rate to said sample stream in said flow path when the sample stream includes said first substance at a selected location in said flow path,

b. adding a conversion reagent stream at essentially the same flow rate as the liquid diluent stream of step (a) at said selected location when the sample stream at said location includes said second substance and simultaneously discontinuing the flow of said liquid diluent stream, whereby liquid flows through said detection zone at a substantially constant rate during detection of said first and second substances.

3,933,431
METHOD AND APPARATUS FOR SAMPLING ATMOSPHERIC MERCURY

Patricio E. Trujillo, Santa Fe; Evan E. Campbell, and Bernard C. Eutsler, both of Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 23, 1974, Ser. No. 491,088
Int. Cl.[2] B01D *53/04;* **B01J** *21/18;* **G01N** *1/22, 31/06*
U.S. Cl. 23—232 R **6 Claims**



5. A method for determining the content of mercury in organic mercurial and metallic mercury vapors in air which

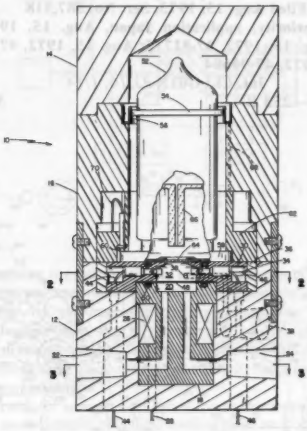
comprises (a) passing a known volume of said air through a first adsorber which selectively and quantitatively adsorbs organic mercurial vapors, (b) then passing said air volume through a second adsorber which quantitatively adsorbs metallic mercury vapor, (c) individually thermally desorbing collected vapors from said first and second adsorbers, (d) reducing said desorbed organic mercurial vapors to metallic mercury vapor, and (e) individually measuring by flameless atomic adsorption spectroscopy the amount of metallic mercury vapor obtained from each of said first and second adsorbers.

3,933,432

PHOTOIONIZATION

John N. Driscoll, Revere, Mass., assignor to HNU Systems Inc., Newton Upper Falls, Mass.

Filed Oct. 29, 1974, Ser. No. 518,231
Int. Cl.[2] G01N *21/26*; H01J *27/00*
U.S. Cl. 23—232 E **25 Claims**



14. In the method of selective photoionization of a component in a gaseous stream in which gases from said stream are passed through a photoionization chamber, radiant energy of a predetermined level is passed through said chamber with said gases therein, and ionization of said component is detected at detector electrodes in said chamber, the improvement in which

said gaseous stream is passed through an inlet into a ballast chamber and is passed through an outlet out of said ballast chamber, a portion of said gases from said stream being diffused from said ballast chamber into said photoionization chamber through a gas permeable organic plastic membrane.

3,933,433

METHOD AND APPARATUS FOR GAS DETECTION

Robert R. Hooker, Ypsilanti, Mich., assignor to Dynamation Enterprises, Inc., Ann Arbor, Mich.

Filed Dec. 18, 1974, Ser. No. 534,072
Int. Cl.[2] G01N *27/16*
U.S. Cl. 23—232 E **8 Claims**

1. A method for continuously sensing the presence of noxious gases in the atmosphere and for differentiating between carbon monoxide and other noxious gases including hydrocarbons, including the steps of providing a semi-conductor catalytic sensor, flowing the gas to be sensed along a flow path to said sensor, moisturizing the gas in said flow path to at least 50% relative humidity, exposing said moisturized gas to said sensor for oxidation of said gas, sequentially applying input voltages at first ans second levels to said sensor, and determining the relative change in the impedance of said sensor as said

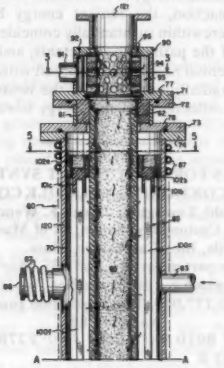
input voltage is changed from said first level to said second level.

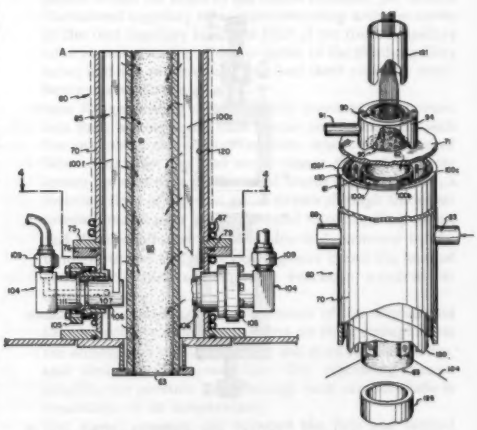
3,933,434

HIGH TEMPERATURE CHEMICAL REACTOR

Edwin Matovich, Brea, Calif.

Filed July 13, 1972, Ser. No. 271,560
Int. Cl. B01j *1/00*
U.S. Cl. 23—252 R **18 Claims**





1. A high temperature reactor wherein substantially all of the heat is supplied by radiation coupling comprising:

a. a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, the reac-

tor tube being made of a porous refractory material capable of emitting sufficient radiant energy to raise the temperature of reactants within the reactor tube to a level required to initiate and sustain the desired chemical reaction; the pores of the refractory material being of such diameter as to permit a uniform flow of sufficient inert fluid which is substantially transparent to radiant energy through the tube wall to constitute a protective blanket for the radially inward surface of the reactor tube;

b. a fluid-tight, tubular pressure vessel enclosing the reactor tube to define an inert fluid plenum between the reactor tube and the pressure vessel, the inlet and outlet ends of the reactor tube being sealed from the plenum; the pressure vessel having an inlet for admitting the inert fluid which is directed under pressure into the plenum and through the porous tube wall into the reactor chember;

c. means for introducing at least one reactant into the reactor chamber through the inlet end of the reactor tube, the reactants being directed in a predetermined path axially of the reactor tube and being confined by the protective blanket substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube;

d. electrical means disposed within the plenum and spaced radially outwardly of the reactor tube for heating the reactor tube to the temperature level at which it emits sufficient radiant energy to initiate and sustain the desired chemical reaction, the radiant energy being directed centrally therewithin substantially coincident with at least a portion of the path of the reactants; and

e. a circumferential heat shield disposed within the pressure vessel and radially outwardly of the heating means, the heat shield reflecting radiant energy toward the reactor tube.

3,933,435

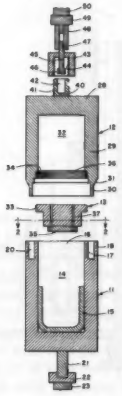
APPARATUS FOR DIRECT MELT SYNTHESIS OF COMPOUNDS CONTAINING VOLATILE CONSTITUENTS

Wilson P. Menashi, Lexington; Joseph F. Wenckus, Needham, and Roger A. Castonguay, Salem, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 365,135, May 30, 1973, Pat. No. 3,825,242, which is a division of Ser. No. 169,315, Aug. 5, 1971, Pat. No. 3,777,009. This application June 3, 1974, Ser. No. 475,780

Int. Cl.² B01D *9/00;* **B01J** *3/00;* **F27B** *14/10*

U.S. Cl. 23—252 R **18 Claims**



1. A reaction vessel suitable for carrying out the melt synthesis of an inorganic compound formed by reacting elemental reactants, at least one of which is essentially nonvolatile and at least another of which is volatile at elevated temperatures, comprising in combination

a. enclosure means defining a reaction chamber for containing a molten mass of said nonvolatile reactant and of said inorganic compound and having an upper access opening;

b. reservoir-closure means defining a reservoir for said volatile reactant, engageable with said upper access opening thereby to form a mechanical seal and having a removable plug defining the bottom of said reservoir-closure means and fluid communication means in said plug through which said volatile reactant may be introduced as a gas into said reaction chamber above said molten means; and

c. liquid sealant channel means associated with said mechanical seal to define therewith a combination liquid-mechanical seal of a character which prevents said liquid sealant from entering said reaction chamber but which permits the diffusing of high-pressure gases therethrough.

3,933,436

AUTOMATIC ANALYZING APPARATUS

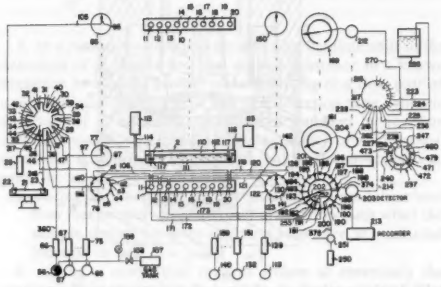
Toyohiko Naono, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,918

Claims priority, application Japan, Aug. 15, 1972, 47-81709; Aug. 15, 1972, 47-81715; Aug. 15, 1972, 47-81721; Aug. 15, 1972, 47-95684

Int. Cl.² G01N *33/16, 1/14*

U.S. Cl. 23—253 R **3 Claims**



1. An automatic analyzing apparatus comprising:

a. a plurality of reaction baths corresponding to selectable reaction treatments or conditions, said baths divided by a partition plate into upper and lower chambers, means for circulating a heated fluid in the lower chambers to maintain a constant temperature, and means connecting the upper chambers to an inert gas source to pressurize said upper chambers;

b. a plurality of reaction tubes, housed in each reaction bath and supported by said partition to open into said upper chambers;

c. means for drawing sample;

d. means for dividing the drawn sample into a given number of portions;

e. means for distributing the divided sample portions, each to a reaction tube in each reaction bath;

f. means for supplying reagents to the reaction tubes comprising reagent reservoirs, which are closed, and means for supplying compressed inert gas to said reservoirs in order to supply reagent to said reaction tubes;

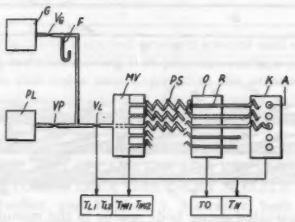
g. means for sequentially feeding contents from reaction tubes in each reaction bath to an analyzer associated with said bath; and,

h. means for backwashing a cleansing solution into said reaction tubes via said means for sequentially feeding contents from reaction tubes to said analyzer.

3,933,437
APPARATUS FOR AUTOMATICALLY PURIFYING EXTRACTS OF VEGETABLE AND ANIMAL SPECIMENS FOR THE DETERMINATION FREE FROM INTERFERENCE OF TRACES OF SELECTED EXTRACT CONSTITUENTS

Winfried Ebing, Trautenaustrasse, 1 Berlin 31, and Jochen Pflugmacher, 67, Hochsitzweg, 1 Berlin 37, both of Germany

Filed Sept. 5, 1973, Ser. No. 394,586
Claims priority, application Germany, Sept. 6, 1972, 2243650
Int. Cl.[2] B01D 11/00; G01N 33/02, 33/16
U.S. Cl. 23—253 R 7 Claims



1. Apparatus for automatically purifying extracts of vegetable and animal specimens for the determination, free from interference by substances including waxes, fats and dyes which interfere with the determination of the active substances, of traces of selected extract constituents by a combined flushing and codistilling process of the extracts with solvents, comprising:

a. a plurality of sample coil tubes for the reception of samples, each sample coil tube having inlet and outlet ends,

b. means for feeding a mixture of solvent and inert gas to said sample coil tubes,

c. multiple way valve means detachably connected to the inlet ends of said sample coil tubes for connecting said mixture feeding means to each of said sample coil tubes in sequence,

d. a plurality of purifying tubes for receiving precipitated constitutents from said samples, each purifying tube having inlet and outlet ends, the inlet end of each purifying tube being detachably connected to the outlet end of one of said sample coil tubes,

e. means surrounding said purifying tubes for heating said purifying tubes to flush and codistil vapors,

f. a plurality of cooling tubes for quantitatively condensing vapors from said purifying tubes forming a condensate therein, each cooling tube having inlet and outlet ends, the inlet end of each cooling tube being connected to the outlet end of one of said purifying tubes,

g. means surrounding said cooling tubes for cooling said cooling tubes,

h. a plurality of receiving tubes, each connected to the outlet end of one of said cooling tubes, for receiving the condensate discharged from said cooling tubes

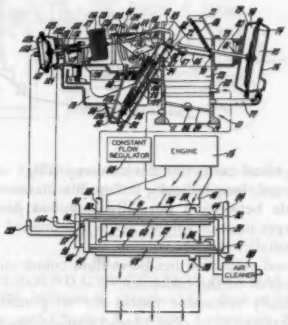
i. timing means for controlling said multiple way valve means to control the time interval during which said mixture feeding means is connected to each sample coil tube and the time interval between connections of said mixture feeding means to successive sample coil tubes, and

j. control means for regulating the temperature of said heating means and said cooling means.

3,933,438
COMBUSTIBLE GAS SENSOR FOR CLOSED LOOP FUEL CONTROL

Lauren L. Bowler, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 5, 1974, Ser. No. 485,913
Int. Cl.[2] F02M 7/12; G01N 31/10, 33/22
U.S. Cl. 23—255 R 1 Claim



1. For use with an internal combustion engine having means for inducting air and fuel in a variable ratio and engine exhaust means, apparatus for sensing air-fuel ratio of the engine exhaust gases and generating a signal for application to the air and fuel inducting means for controlling the ratio of air and fuel inducted in closed loop control, the apparatus comprising:

a pair of sensor conduits within the exhaust means, each sensor conduit having an exhaust gas inlet orifice open in the exhaust means and an outlet, one of the sensor conduits having an air inlet orifice adjacent the exhaust gas inlet orifice and open to atmosphere;

first, second, third and fourth capillary tubes having inlets and outlets and being coated on their outer surfaces with an oxidationn catalyst substance, the first and fourth capillary tubes being coadjacent within the one sensor conduit, the second and third capillary tubes being coadjacent within the other of the sensor conduits, the inlet of the second capillary tube communicating with the outlet of the first capillary tube, the inlet of the fourth capillary tube communicating with the outlet of the third capillary tube, and the inlets of the first and third capillary tubes being open to atmosphere;

means for generating a substantially constant air pressure less than atmospheric, said means communicating with the outlets of the sensor conduits, whereby a metered flow of exhaust gas and air is drawn through the one sensor conduit over the first and fourth capillary tubes, a metered flow of exhaust gas is drawn through the other sensor conduit over the second and third capillary tubes, and the temperature of each tube is determined by the temperature of the gases flowing over it and the heat of catalytically induced chemical reactions adjacent its outer surface;

means communicating with the outlets of the second and fourth capillary tubes for drawing air therethrough from the atmosphere through the first and third capillary tubes, said means including constant flow regulating means, whereby the pressure drop through each capillary tube is dependent on its temperature;

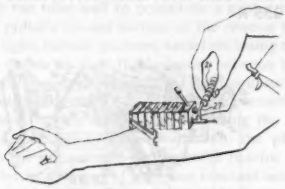
a first signal pressure tap between the first and second capillary tubes; and

a second signal pressure tap between the third and fourth capillary tubes, the pressure differential between the first and second signal pressure taps comprising a signal indicative of exhaust gas air-fuel ratio.

3,933,439
BLOOD COLLECTION DEVICE

Bernard McDonald, 24826 Malibu Road, Malibu, Calif. 90265

Filed Apr. 29, 1974, Ser. No. 464,807
Int. Cl.² G01N 1/12, 1/14, 33/16
U.S. Cl. 23—259 10 Claims

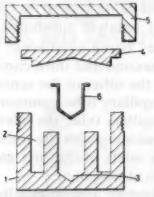


1. A blood collection device comprising:
a closed, longitudinally collapsible elastic container movable between a normally extended position having a larger interior volume and a compressed position having a smaller interior volume;
a blood collection needle in fluid communication with the interior of the container;
manually releasable means for temporarily securing the container in its compressed position; and
a permeable member mounted within the container and including blood clotting sites exposed on the surfaces thereof.

3,933,440
CHEMICAL REACTION VESSEL

John Frederick Woolley, Sawbridgeworth, England, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,569
Claims priority, application United Kingdom, Sept. 20, 1973, 44086/73
Int. Cl.² B01L 1/00, 7/00; G01N 33/38
U.S. Cl. 23—259 5 Claims



1. A gas-tight chemical reaction vessel comprising a body member having a first chamber for reagents and at least one sample chamber, a sample cap within each sample chamber, said cap being adapted to contain a sample of intractable material, a sealing member for sealing the body member, and a cap for securing the sealing member against the body, said sealing member providing a gas-tight relationship with said body while retaining a vapor passageway between said first and said sample chambers, and in which the body, the sealing member and the sample cap are made of a material which is chemically inert to the reagents.

3,933,441
THIN, CONTINUOUS STEEL WIRES

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, France

Division of Ser. No. 248,569, April 28, 1972, abandoned. This application June 11, 1973, Ser. No. 368,823
Claims priority, application France, May 10, 1971, 71.16882
Int. Cl.² B21C 1/02
U.S. Cl. 29—183.5 2 Claims

1. Thin, continuous steel wires of a diameter between 30 and 400μ having manganese (x) and silicon (y) contents, expressed in percentages by weight with respect to the iron content of the steel, such that for any value of (x) the value for (y) is greater than that given by the equation

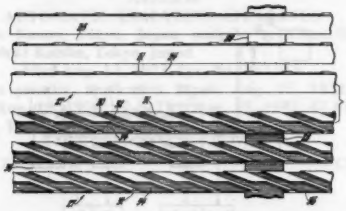
$$y = 0.55\,x^2 - 0.18x + 0.1$$

said steel wires having silica as the principal oxidation product therein.

3,933,442
LAMINATED BODY

Charles D. Carroll, Greensburg, and George B. Meginnis, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 307,446, Nov. 17, 1972, Pat. No. 3,834,001. This application May 3, 1974, Ser. No. 466,741
Int. Cl.² B32B 15/00
U.S. Cl. 29—191 4 Claims



1. A laminated metal body usable in the manufacture of a porous seal element having a seal face adapted to cooperate with the other element of a seal and having a rear face, the body comprising a plural number of metal sheets each divided by parallel slots into parallel metal strips, each strip having two edges, the strips being joined by weak metal ties extending between edges of adjacent strips across the slots, the sheets being stacked and bonded together with the strips aligned and abutting, a large portion of the strips having grooves extending across at least one face thereof to define with the face of an abutting strip pores extending between the stacked strips from edge to edge of the strips.

3,933,443
COKING COMPONENT

Hugo Lohrmann, Holzhauerthalstrasse, Neunkirchen-Heinitz, Germany

Continuation of Ser. No. 214,450, Dec. 30, 1971, abandoned. This application Jan. 17, 1974, Ser. No. 434,225
Claims priority, application Australia, May 18, 1971, 28965/71
Int. Cl.² C10L 5/10; C10B 53/00; C09K 3/00
U.S. Cl. 44—1 C 12 Claims

1. A coking component of a coking mixture which is easier to transport than coke dust and which has an increased fixed carbon content, said coking component consisting of a mixture of 10–60% of finely ground coke and at least one carbon-containing substance selected from the group consisting of coking coal, non-coking coal, petroleum coke, semi-coke or lignite; said carbon-containing substance having a particle size of 90% below 3 mm; said coking component adapted to be mixed with coal to form the coking mixture and coked.

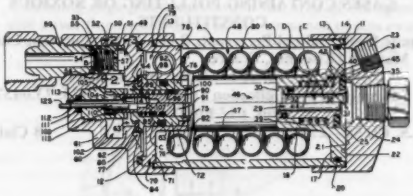
3,933,444
FLASH BACK ARRESTOR

Charles Ray Kilgore, Rocky River, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 29, 1974, Ser. No. 465,250
Int. Cl.² F17D 3/00
U.S. Cl. 48—192 16 Claims

1. A safety device for automatically interrupting a flash back through a gas supply conduit comprising in combination; a housing, means defining a passageway in said housing having an inlet end and an outlet end, a pressure actuated valve comprising a valve seat surrounding the inlet end of said passageway and a valve member freely slidable in said housing on a line of movement from a first position spaced from said valve seat to a second position sealingly engaging said valve

seat, said valve member having a first pressure surface on the end remote from said valve seat exposed to pressures at the outlet end of said passageway and a second pressure surface exposed to pressures at the inlet end of said passageway, a locking member slidably supported in said valve member on said line of movement and having a first position toward said



pressure surface and a second position toward said valve seat, said locking member having first pressure surface on the end remote from said valve seat exposed to the pressures at the outlet of said passageway and means biasing said locking member relative to said valve member to said first position.

3,933,445

PROCESS AND APPARATUS FOR PREVENTING DEPOSITS ON A GAS INLET NOZZLE

David E. Mueller, and William J. Metrailer, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 15, 1973, Ser. No. 406,219

Int. Cl.² C10J *3/54*

U.S. Cl. 48—197 R **7 Claims**

1. In a gasification process wherein an oxygen-containing fluidizing gas is introduced through a nozzle into a bed of carbonaceous particles containing metallic contaminants, the improvement which comprises: preventing the formation of metallic ash deposits on said nozzle by introducing said oxygen-containing fluidizing gas into said bed as a downwardly directed stream at an angle of declination from a horizontal axis at least as great as the angle of repose of said bed particles and at an inlet velocity into said bed in the range of about 50 to 500 feet per second.

3,933,446

PROCESS FOR THE PRODUCTION OF A SUBSTITUTE NATURAL GAS

Cyril Timmins, London, England, assignor to British Gas Corporation, London, England

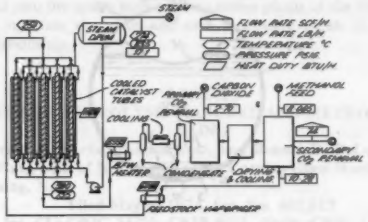
Filed Dec. 20, 1973, Ser. No. 426,455

Claims priority, application United Kingdom, Dec. 20, 1972, 58728/72

Int. Cl.² C10K *3/02*

U.S. Cl. 48—197 R **3 Claims**

1. A process for the production of gases suitable for substitution for Natural Gas which process comprises preheating methanol to a temperature of at least 250°C to form a methanol vapor, passing said vapor through a bed of nickel catalyst in an isothermal reactor to form a product gas, maintaining said catalyst bed at a single isothermal temperature within the



range of 250° to 350°C by external cooling with boiling water at a steam pressure of at least 550 psig, and removing carbon dioxide from said product gas.

3,933,447

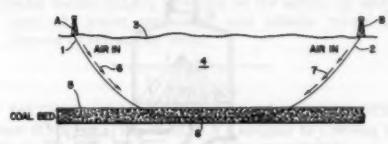
UNDERGROUND GASIFICATION OF COAL

Joseph Pasini, III; William K. Overbey, Jr., both of Morgantown, W. Va., and Charles A. Komar, Uniontown, Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,170

Int. Cl.² C10J *5/00;* **E21C** *43/00*

U.S. Cl. 48—210 **12 Claims**



1. A method for the in situ combustion of coal in a coalbed comprising:

determining the major natural fracture system of the coalbed;

drilling at least one well or borehole from the surface to intersect the coalbed while traveling in a horizontal direction and intersecting the major natural fracture system of the coalbed at a predetermined angle;

maintaining said well or borehole in said horizontal direction intersecting the major natural fracture system of the coalbed at said predetermined angle;

initiating burning of the coal while introducing a combustion supporting gas through said well or borehole to convert the coal in situ to a relatively high Btu gas; and

recovering said relatively high Btu gas.

3,933,448

GAS SEPARATOR FOR LIQUID SUPPLY

Leonard J. Di Peri, 18325 Lahey St., Northridge, Calif. 91324

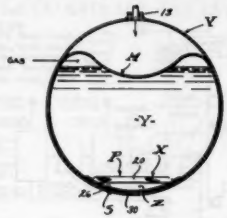
Filed Aug. 20, 1971, Ser. No. 173,548

Int. Cl.² B01D *53/22*

U.S. Cl. 55—159 **2 Claims**

1. A device for acquisition of gas-free liquid from a closed storage vessel having an acquisition opening in one side portion thereof, and including; a collapsible imperforate membrane coextensively lining the interior of the vessel, and a porous surface tension partition juxtapositioned in closely spaced relation to and with its periphery sealed with the membrane and disposed over said side portion of the vessel and the

acquisition opening therein and defining a liquid acquisition chamber in open communication with said liquid acquisition opening and separate from a liquid storage chamber within the membrane.

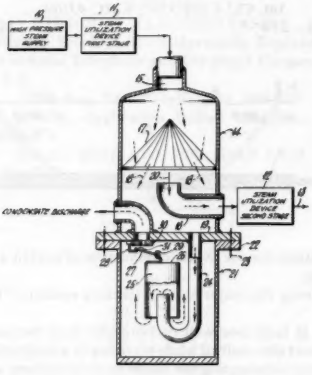


3,933,449

MEANS FOR SEPARATION AND DRAINAGE OF LIQUID FROM A POINT BETWEEN SUCCESSIVE STAGES OF STEAM UTILIZATION

Abraham C. Miselem, Pachuca No. 87-102, Mexico, D.F., Mexico

Filed July 15, 1974, Ser. No. 488,418
Int. Cl.² B01D 45/12
U.S. Cl. 55—218 **8 Claims**



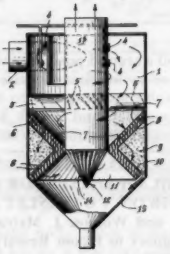
2. A combined gas trap and liquid separator, comprising an upper gas-chamber body and a lower liquid-trap-chamber body removably carried by and beneath said gas-chamber body, said gas-chamber body having an upper inlet port for admission of a flow of liquid-gas mixture, flow-deflector means comprising a generally conical array of swirl-inducing blades carried within said gas-chamber body and effectively dividing the interior of said gas-chamber body into an upper inlet region and a lower discharge region, thereby imparting to the inlet flow of admitted mixture a rotary swirl about a central axis of flow, and thereby also centrifugally directing to an outer zone of greatest radii about said axis the liquid component of the mixture, a gas-outlet port including a conduit having an open inlet end above the bottom of the lower region and facing the flow discharged by said deflector means, said open end having an area confined to a central zone of lesser radii about said axis, trap means including an inverted bucket movably suspended within said trap-chamber body, and a liquid drain conduit extending from the outer zone of said gas-chamber body and positioned to discharge into the interior of said inverted bucket, said trap means including valve-controlled means discharging external to said bodies and having an operating connection to a movable part of the bucket suspension.

3,933,450

PURIFIER FOR THE PHYSICAL-CHEMICAL TREATMENT OF COMBUSTION GASES AND OTHER GASES CONTAINING POLLUTING OR NOXIOUS CONSTITUENTS

Emile Henri Gabriel Percevaut, Route de Longjumeau, Chilly Mazarin (Essonne), France

Filed Feb. 5, 1974, Ser. No. 439,944
Claims priority, application France, Feb. 7, 1973, 73.04376
Int. Cl.² B01D 47/06
U.S. Cl. 55—223 **8 Claims**



1. A purifier of the cyclone-washer type for treating gases containing polluting or noxious constituents comprising:

a cylindrical wall concentric about a vertical axis defining a first chamber therein,

inlet duct means communicating with said first chamber through which gases to be treated can enter said first chamber,

said inlet duct means being directed tangentially into said first chamber for swirling the gases entering within said first chamber in a first direction about said vertical axis,

spray means associated with said first chamber for spraying washing liquid droplets into the swirling gases in said first chamber for treating gases therein,

said cylindrical wall extending downwardly below said first chamber,

a ring of helicoidal blades positioned within said cylindrical wall in the lower part of said first chamber, said helicoidal blades projecting the swirling mixture of gases and liquid droplets downwardly from said first chamber within said cylindrical wall below said ring of blades,

a honeycomb structure of curved vanes positioned within said cylindrical wall below said ring of blades for increasing the length of the path traversed by said mixture of gases and liquid droplets,

a hopper at lower part of said cylindrical wall below said honeycomb structure for receiving the washing liquid, and

a central evacuation duct communicating with the region within said cylindrical wall below said honeycomb structure and extending upwardly along said axis.

3,933,451

DUST COLLECTING BAG

Goran R. Johansson, Lilla Edet, Gota, Sweden

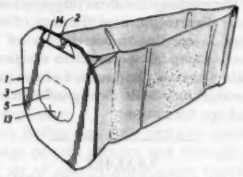
Filed Apr. 19, 1973, Ser. No. 352,709
Claims priority, application Sweden, Apr. 24, 1972, 5339/72
Int. Cl.² B01D 46/02
U.S. Cl. 55—367 **1 Claim**

1. Dust collecting bag including a substantially rigid endwall, said endwall comprising:

a central opening, said opening including locking means disposed about a small portion of its edge;

a cover flap having a free defining edge, said cover flap pivotally resiliently mounted on said endwall along a portion of the edge of said opening, said cover flap covering said opening when locked into a covering position by said locking means, with at least a portion of said free defining edge positioned within the area of the opening;

said cover flap further includes the presence of slits extending from said at least a portion of said free defining edge,



said portion located substantially diametrically opposite the pivotable mounting of said cover flap and with the part of said free edge defined by said slits being pivotable out of the plane defined by the remainder of the cover flap;

said locking means located substantially diametrically opposite the pivotal mounting of said cover flap and consisting of at least one pliable locking flap, said locking flap overlying said at least a portion of said free defining edge and biased against the resilient mounting of the cover flap when the cover flap is in a closed and locked position.

3,933,452

FILTER CARTRIDGE FOR SUSPENDED PARTICLES

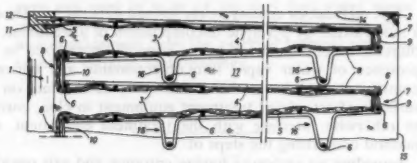
Ernst Rudin, Arboldswil, Switzerland, assignor to H. Gertsch & Co. Aktiengesellschaft, Zurich, Switzerland

Filed Sept. 3, 1974, Ser. No. 502,474

Claims priority, application Switzerland, Sept. 14, 1973, 13233/73

Int. Cl.² B01D *46/10*

U.S. Cl. 55—499 **4 Claims**



1. A filter cartridge for filtering suspended particles from a fluid passing through the cartridge, comprising:

a frame defining an inlet opening for admitting fluid to be filtered and an outlet region for permitting filtered fluid to leave the frame;

grid means positioned in the frame and having peripheral portions embedded therein;

an elongate filter web positioned in the frame and having peripheral portions embedded therein, the web being supported and backed by the grid means and having one main surface facing towards said inlet opening and its other main surface facing towards the grid means and said outlet region so that fluid to be filtered passes through the web in the direction from said one main surface towards said other main surface,

the grid means being elongate and comprising a plurality of essentially planar grids extending substantially parallel to one another away from the inlet opening and secured together end-to-end by clamps, and the web being folded along a plurality of fold regions spaced apart along the web to give it a pleated configuration with the pleats extending between respective pairs of adjacent grids, at least one of said grids being formed with a projection protruding out of the plane of the grid into the space between successive pleats of the filter web to maintain the grids and said successive pleats in spaced relationship.

3,933,453

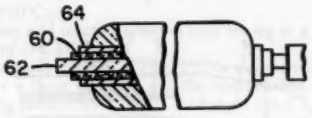
FLAME HYDROLYSIS MANDREL AND METHOD OF USING

Gerald E. Burke, Painted Post, and Robert D. DeLuca, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 6, 1974, Ser. No. 467,017

Int. Cl.² C03C *25/02*; **C03B** *9/32*, *19/06*; **C03C** *15/00*

U.S. Cl. 65—3 **17 Claims**



1. In an apparatus for forming a hollow cylindrical glass article comprising

a cylindrically shaped mandrel, and

means for forming a glass coating on the surface of said mandrel,

said mandrel being characterized in that it comprises

a cylindrical support, and

tubular means slidably mounted on the surface of said support, the outer surface of said tubular means being formed of refractory metal.

3,933,454

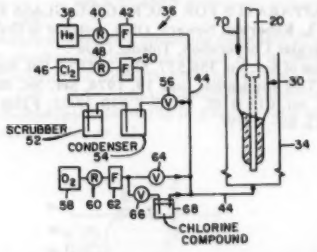
METHOD OF MAKING OPTICAL WAVEGUIDES

Robert D. DeLuca, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,962

Int. Cl.² C03C *25/02*, *21/00*, *17/22*

U.S. Cl. 65—3 **18 Claims**



1. In the method of forming a glass article comprising the steps of

depositing on a starting member a coating of flame hydrolysis-produced glass soot to form a soot preform,

consolidating said soot preform to form a dense glass layer free from particle boundaries, and

forming said dense glass layer into a desired shape, said consolidation step being characterized in that it comprises

heating said soot preform to a temperature within the consolidation temperature range for a time sufficient to cause said soot particles to fuse and form a dense glass layer, and simultaneously

subjecting said soot preform to a stream of a substantially dry, hydrogen-free, chlorine containing atmosphere that is substantially free from contaminants that would adversely affect the optical properties of said glass article, said chlorine permeating the interstices of said soot preform during the consolidation thereof and replacing hydroxyl ions by chlorine ions, thereby resulting in a glass article that is substantially water-free.

3,933,455

METHOD FOR JOINING OPTICAL FIBRE BUNDLES

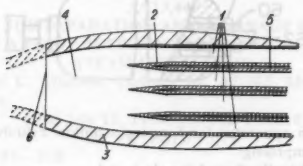
Martin Chown, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 17, 1974, Ser. No. 470,882

Claims priority, application United Kingdom, June 14, 1973, 28284/73

Int. Cl.² C03B *23/20*; G02B *5/14*

U.S. Cl. 65—4 **2 Claims**



1. A method of providing a coupling region at least one of the ends of a glass optical fibre-bundle including a plurality of glass fibres each having an inner core glass and outer cladding glass, which method includes the steps of etching the fibres at that end of the bundle to remove the cladding glass and produce tapered ends to the individual fibres, of inserting the tapered ends into the bore of a glass tube having a lower refractive index than that of the fibre cores, of heating and fusing the assembly of tube and fibre ends while drawing it down so as to provide a solid zone of core glass within the tube and to eliminate the cladding glass and interstices between the side walls of the tapered ends of the fibres in said zone, and of forming a polished end within said zone.

3,933,456

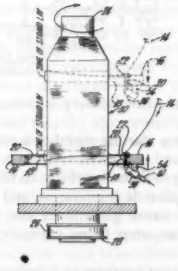
APPARATUS FOR PACKAGING GLASS FIBERS

Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 356,537, May 2, 1973, Pat. No. 3,851,435. This application June 19, 1974, Ser. No. 480,902

Int. Cl.² D10L *13/26*; C03B *37/02*; F26B *7/00*

U.S. Cl. 65—11 W **3 Claims**



1. Apparatus for packaging glass strand comprising:

means for supplying streams of molten glass for attenuation into continuous glass filaments:

means for applying liquid to the filaments;

means for gathering the wet filaments into a glass strand;

a winder under the means for supplying molten glass streams including a rotatable collector upon which the glass strand is collected into successive layers as a wound package, means for rotating the collector, and strand traversing means including a reciprocatable mounted strand guide and means for reciprocating such guide lengthwise of the collector to distribute the strand on the package during its formation; and

means immediately adjacent to the outer circumferential surface of the package for directing a stream of air at the package effective to increase the rate of evaporation of liquid from successive outer layers of the package wherein such means is mounted to reciprocate with the strand guide whereby the exterior of the package is progressively subjected to the drying influence of the stream during package formation.

3,933,457

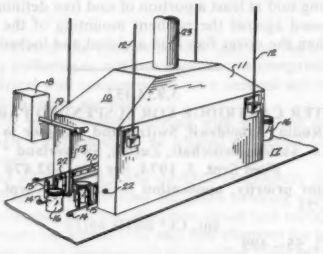
APPARATUS AND METHOD FOR TREATING VITREOUS SURFACES

Addison B. Scholes, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 54,417, July 13, 1970, abandoned. This application May 21, 1974, Ser. No. 472,044

Int. Cl.² C03C *17/22*

U.S. Cl. 65—60 **7 Claims**



1. A method for coating newly formed vitreous articles with a metal oxide by pyrolytic decomposition of a treatment gas thereon which treatment gas is normally hydrolized in the presence of water vapor into objectionable and corrosive constituents which can then undesirably accumulate on the surfaces of associated treatment equipment to clog, corrode or otherwise interfere with the treatment equipment, said method comprising the steps of:

providing an enclosure having entrance and exit openings therein for the passage of said articles,

moving said articles through said enclosure,

allowing ambient air of uncontrolled water vapor content to pass into said enclosure through said openings,

providing an upwardly extending vent from said enclosure for conducting used treatment gas vapors from said enclosure,

directing a supply of said treatment gas inside said enclosure through a distribution manifold on both sides of said articles in a direction towards said articles while said articles are at a temperature above the pyrolytic decomposition temperature of said treatment gas,

burning sufficient quantities of heating gas within the enclosure, at locations along both sides of the enclosure between said openings and at a lower level of said enclosure opposite said vent (1) to substantially maintain the atmosphere temperature within said enclosure above a predetermined critical temperature at which water vapor forms hydrates with the treatment gas and, at the same time, (2) to maintain the internal surfaces of the enclosure and of

the vent above said critical temperature due to movement of the heated atmosphere therewithin from the lower level where the heating gas is burned to and through said vent whereby said objectionable constituents are substantially prevented from forming either in said atmosphere or on the internal surfaces of said enclosure and vent in spite of the fact that water vapor is present as a combustion product of said heating gas as a contaminant from the external ambient atmosphere entering through said openings.

7. Apparatus for coating newly formed vitreous articles with a metal oxide by pyrolytic decomposition of a treatment gas thereon which treatment gas is normally hydrolized in the presence of water vapor into objectionable and corrosive constituents which can then undesirably accumulate on the surfaces of associated treatment equipment to clog, corrode or otherwise interfere with the treatment equipment, said apparatus comprising:

an enclosure having entrance and exit openings therein for the passage of said articles and through which openings ambient air of uncontrolled water vapor content passes into said enclosure, said enclosure also being provided with an upwardly extending vent for conducting used treatment gas vapors from said enclosure,

means for moving said articles through said enclosure,

manifold distribution means for directing a supply of said treatment gas inside said enclosure through a distribution manifold on both sides of said articles in a direction towards said articles while said articles are at a temperature above the pyrolytic decomposition temperature of said treatment gas,

means for burning sufficient quantities of heating gas within the enclosure, at locations along both sides of the enclosure between said openings and at the lower level of said enclosure opposite said vent (1) to substantially maintain the atmosphere temperature within said enclosure above a predetermined critical temperature at which water vapor forms hydrates with the treatment gas and, at the same time, (2) to maintain the internal surfaces of the enclosure and of the vent above said critical temperature due to movement of the heated atmosphere therewithin from the lower level where the heating gas is burned to and through said vent whereby said objectionable constituents are substantially prevented from forming either in said atmosphere or on the internal surfaces of said enclosure and vent in spite of the fact that water vapor is present as a combustion product of said heating gas and as a contaminant from the external ambient atmosphere entering through said openings.

3,933,458
METHOD OF MAKING A RIGID UNITARY FERTILIZER COMPOSITE

Warren H. Philipp, 6234 Columbia Road, North Olmsted, Ohio 44070

Continuation-in-part of Ser. No. 412,272, Nov. 2, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,740

Int. Cl.² C05G *1/00*; C05C *13/00*

U.S. Cl. 71—27 **11 Claims**

1. A method of forming a rigid, unitary mass plant and soil conditioner composite for use in treating plants and trees comprising the steps of forming an aqueous paste of plant and soil conditioners, acrylamide, a catalyst, and between about 5 and 40 volume percent water, said acrylamide being present in an amount sufficient to provide at least 5 percent by weight of polyacrylamide in the final product, forming said aqueous paste to a desired shape, polymerizing said acrylamide to form polyacrylamide, and drying said molded content to remove substantially all of said water.

3,933,459
HIGH-MAGNESIUM AMMONIUM POLYPHOSPHATE SOLUTIONS

William Percy Moore, Hopewell, Va., and James Earl Sansing, Baton Rouge, La., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 390,832, Aug. 23, 1973. This application Oct. 11, 1974, Ser. No. 513,980

Int. Cl.² C05B *7/00*

U.S. Cl. 71—34 **2 Claims**

1. A process for producing and storing stable ammonium polyphosphate solutions containing at least 0.35% by weight MgO, comprising:

a. mixing 24–40% by weight aqueous ammonia with superphosphoric acid containing 66–76% by weight P_2O_5 and 0.7–2.0% by weight MgO to give a reaction solution having a P_2O_5/N weight ratio of 3.6–4.0 and a pH in the range 5.0–5.7;

b. maintaining the temperature of the reaction at 50°–100°C.;

c. cooling said reaction solution after mixing to a temperature of 25°–35°C.; and

d. storing said solution at 25°–35°C. in a carbon steel tank, under a layer of liquid paraffin hydrocarbon having a boiling point of 150°–300°C., and at pH 5.0–5.7, whereby the solution remains stable and does not precipitate solids for at least 250 days, and shows a corrosion rate in said carbon steel tank of less than 1.4 mils per year, said corrosion rate being measured below the air-liquid interface of the solution.

3,933,460
HERBICIDAL MIXTURE OF A BENZOFURANYL METHANESULFONATE AND A SUBSTITUTED PYRIDAZONE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 1, 1974, Ser. No. 484,974

Claims priority, application Germany, July 9, 1973, 2334787

Int. Cl.² A01N *9/00*

U.S. Cl. 71—88 **1 Claim**

1. A herbicide composition consisting essentially of an inert carrier and a herbicidally effective amount of a mixture of (a) 2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methane sulfonate and (b) 1-m-trifluoromethylphenyl-4-dimethylamino-5-chloropyridazone-(6) in a weight ratio of (a) to (b) in the range of 3:1 to 1:3.

3,933,461
HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 3, 1974, Ser. No. 476,150

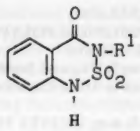
Claims priority, application Germany, June 16, 1973, 2330743

Int. Cl.² A01D *9/14*

U.S. Cl. 71—91 **4 Claims**

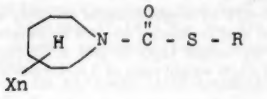
1. A herbicide composition containing a herbicidally effective amount of mixture of

a. a compound having the formula



wherein R^1 denotes lower alkyl, or a salt of said compound, and

b. a compound having the formula



wherein X denotes lower alkyl, *n* denotes one of the integers 0, 1, 2 and 3, and R denotes lower alkyl, benzyl or benzyl substituted by lower alkyl in a weight ratio of *a* to *b* in the range of 5:1 to 1:5.

3,933,462

MIXTURE OF SUBSTITUTED BENZOTHIADIAZINONES AND BENZONITRILES AS HERBICIDES

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application July 30, 1974, Ser. No. 493,116

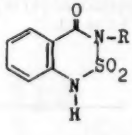
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 **6 Claims**

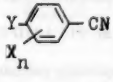
1. A herbicide composition comprising an inert carrier containing a herbicidally effective amount of a mixture of herbicides consisting essentially of

a. a compound of the formula

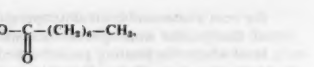


where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, ammonium, alkaline earth metal, lower alkyl ammonium, lower hydroxyalkylammonium or hydrazine salt thereof, and

b. a compound of the formula



where Y denotes hydroxy or the radical



X denotes bromine or iodine and *n* denotes the integer 2 in a weight ratio of *a* to *b* in the range of 5:1 to 1:5.

3,933,463

HERBICIDALLY ACTIVE IMIDAZOLIDIN-2-ON-1-CARBOXYLIC ACID AMIDES

Ferdinand Munz, Schildgen; Helmuth Hack, Cologne-Buchheim, and Ludwig Eue, Cologne-Stammheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

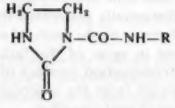
Filed July 28, 1969, Ser. No. 845,540

Claims priority, application Germany, Aug. 13, 1968, 1795117

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **13 Claims**

1. Herbicidal composition which consists essentially of a mixture of a dispersible carrier vehicle selected from the group consisting of (1) a finely divided dispersible carrier solid containing a surface-active agent selected from the group consisting of non-ionic emulsifying agents, anionic emulsifying agents, dispersing agents, and mixtures of such agents, and (2) a dispersible carrier liquid selected from the group consisting of inert organic solvents, water, and mixtures thereof, and containing a surface-active agent selected from the group consisting of non-ionic emulsifying agents, anionic emulsifying agents, dispersing agents, and mixtures of such agents, and a herbicidally effective amount, constituting substantially between about 0.005–95% by weight of the mixture, and sufficient to combat weeds, of an imidazolidin-2-on-1-carboxylic acid amide of the formula



in which R is selected from the group consisting of alkyl of 1–4 carbon atoms and alkenyl of 3–4 carbon atoms.

3,933,464

HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 348,085, April 4, 1973. This application May 23, 1974, Ser. No. 472,653

Claims priority, application Germany, Apr. 13, 1972, 2217698

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **2 Claims**

1. A herbicide composition containing a herbicidally effective amount of a mixture consisting essentially of (a) 2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranylmethane sulfonate and (b) 3-cyclohexyl-5,6-trimethylene uracil in a weight ratio of *a* to *b* in the range of 5:1 to 1:5.

3,933,465

HERBICIDE MIXTURES OF 2-ETHOXY-2,3-DIHYDRO-3,3-DIMETHYL-5-BENZOFURANYLMETHANE SULFONATE

Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 348,085, April 4, 1973. This application July 30, 1974, Ser. No. 493,113

Claims priority, application Germany, Apr. 13, 1972, 2217698

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **2 Claims**

1. A herbicide composition containing a herbicidally effective amount of a mixture of (a) 2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranylmethane sulfonate, (b) 3-methoxycarbonylaminophenyl-N-(3′-methylphenyl)-carbamate, and (c) 1-phenyl-4-amino-5-chloropyridazone-(6) in a weight ratio of a:b:c of 1–10:1–10:1–10.

3,933,466

URACIL AND CARBAMATE HERBICIDE MIXTURES

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 348,085, April 4, 1973. This application July 30, 1974, Ser. No. 493,114

Claims priority, application Germany, Apr. 13, 1972, 2217698

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **1 Claim**

1. A herbicide composition containing a herbicidally effective amount of a mixture of (*a*) 3-cyclohexyl-5,6-trimethylene uracil and (*b*) 3-methoxycarbonylaminophenyl-N-(3′-methylphenyl)-carbamate in a weight ratio of *a* to *b* in the range of 10:1 to 1:10.

3,933,467

SUBSTITUTED NITROANILINES AND SUBSTITUTED 1, 3, 5-TRIAZINES AS HERBICIDAL MIXTURES

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 162,317, July 13, 1971, Pat. No. 3,849,107. This application May 23, 1974, Ser. No. 472,646

Claims priority, application Germany, July 28, 1970, 2037265

Int. Cl.² A01N 9/22

U.S. Cl. 71—93 **2 Claims**

1. A herbicide composition containing a herbicidally effective amount of a mixture consisting essentially of

a. N-n-propyl-N-β-chloroethyl-2,6-dinitro-4-trifluoromethylaniline and

b. 2-methylmercapto-4,6-diisopropylamino-1,3,5-triazine; 2-methoxy-4-ethylamino-6-isopropylamino-1,3,5-triazine; 2-azido-4-sec.butylamino-6-methylmercapto-1,3,5-triazine; 2-chloro-4-ethylamino-6-tert-butylamino-1,3,5-triazine; 2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine; 2-chloro-4,6-diethyl-amino-1,3,5-triazine; or 2-(2-chloro-4-ethylamino-1,3,5-triazine-6-yl-amino)-2-methylpropionitrile in a weight ratio of compound a to compound b in the range of 3:1 to 1:3.

3,933,468

HERBICIDAL COMPOSITIONS

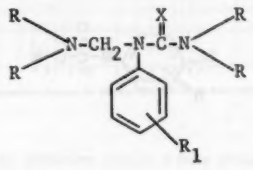
Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 247,671, April 26, 1972, Pat. No. 3,860,410, which is a division of Ser. No. 99,658, Dec. 18, 1970, abandoned. This application Aug. 26, 1974, Ser. No. 500,217

Int. Cl.² A01N 9/22

U.S. Cl. 71—95 **6 Claims**

1. The method of controlling undesirable vegetation comprising applying to the locus where control is desired an herbicidally effective amount of a compound having the generic formula



wherein X is oxygen or sulfur, each set of the two R groups form a ring structure having 4 carbon atoms, R_1 is hydrogen, halogen, haloalkyl, alkyl or alkoxy.

3,933,469

METHODS FOR INCREASING CROP YIELDS

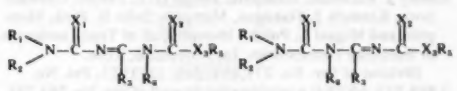
James D. Long, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 414,876, Nov. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 348,323, April 5, 1973, abandoned. This application Feb. 28, 1974, Ser. No. 446,800

Int. Cl.² A01N 9/12

U.S. Cl. 71—100 **12 Claims**

1. Method for increasing the yield of corn crops by applying an allophanimidate to the crop plants during inflorescence initiation or early development and in an amount sufficient to increase the number of inflorescences or the number of florets per inflorescence but insufficient to cause substantial foliar burn, chlorosis, or necrosis, the allophanimidate being a compound of one of the following formulas:



wherein

X_1 and X_2 are oxygen;

X_3 is oxygen or sulfur;

R_1 is hydrogen;

R_2 is monohalophenyl or dihalophenyl;

R_3 is OR_4 or SR_4;

where

R_4 is methyl or ethyl;

R_5 is methyl or ethyl; and

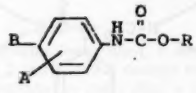
R_6 is hydrogen.

3,933,470
ESTER OF (ALKYNYLOXY)-, (ALKENYLOXY)-, AND (CYANOALKOXY) CARBANILIC ACIDS AND THEIR USE AS HERBICIDES

Barrington Cross, Rocky Hill, and Robert Louis Arotin, Willingboro, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 267,838, June 30, 1972, Pat. No. 3,852,532. This application May 24, 1974, Ser. No. 473,030
Int. Cl.² A01N 9/20
U.S. Cl. 71—111 **9 Claims**

1. A method for the control of undesirable plant species comprising applying to said undesirable plants or locus of plants or seeds a herbicidally effective amount of a compound of the formula:



wherein A is hydrogen, chlorine or $-OCH_2C\equiv CH$; B is hydrogen, $-O-CH_2C\equiv CH$ or $-OCH_2CH=CH_2$; R is alkyl (C_1-C_4) benzyl, or cyclohexyl; provided that A and B are both not hydrogen.

3,933,471
COMPOSITIONS FOR CONTROLLING WEEDS

Pierre Poignant, Nyons; Bernard Thellot, Villefranche, and Jacques Rognon, Ecully, all of France, assignors to PEPRO, Societe pour le Development et la Vente de Specialites, Lyon, France

Filed Feb. 1, 1974, Ser. No. 438,647
Claims priority, application France, Feb. 2, 1973, 73.04389
Int. Cl.² A01N 9/20
U.S. Cl. 71—120 **12 Claims**

1. An herbicidal composition for killing weeds growing among crops, consisting essentially of

as active material an amount sufficient to kill said weeds without phytotoxicity to said crops, of a mixture of one part by weight of N-4-isopropylphenyl-N′,N′-dimethylurea (I.P.U.) and 0.5 to 3 parts by weight of 2-4-dinitro-6-tert.-butyl-phenol (dinoterbe) or the alkali metal, ammonia and amine salts thereof,

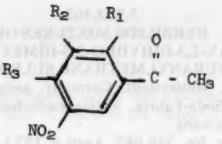
and an inert herbicidal carrier and a wetting agent.

3,933,472
SUBSTITUTED ALKYLARYL KETONES AND METHODS OF USE AS HERBICIDES

Stanley J. Buckman, Memphis; Joseph G. E. Fenyes, Germantown; Kenneth J. Flanagan, Memphis; John D. Pera, Memphis, and Miguel L. Pulido, Memphis, all of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Division of Ser. No. 271,454, July 13, 1972, Pat. No. 3,869,513, which is a continuation-in-part of Ser. No. 261,751, June 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,476, Feb. 29, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,351
Int. Cl.² A01N 9/20
U.S. Cl. 71—121 **4 Claims**

1. The method of controlling the growth of germinating and seedling weed grasses and germinating and seedling broadleaf weeds without damaging the desirable crop plants present in the same area which comprises applying to said area an effective amount of a compound of the following formula:



wherein R_1 or R_2 is nitro, R_1 or R_3 is dipropylamino, and one of R_1, R_2 and R_3 is hydrogen.

3,933,473
METHOD FOR RECOVERING A USABLE ALLOY FROM TITANIUM SCRAP

James Dickson, Stirling, N.J., assignor to Airco, Inc., Murray Hill, New Providence, N.J.

Filed Oct. 19, 1973, Ser. No. 408,237
Int. Cl.² C22B 4/06
U.S. Cl. 75—10 R **10 Claims**

1. The method of obtaining a weldable, forgeable, ductile, corrosion resistant product alloy from scrap metal alloy of a major component of titanium having additives including at least in excess of 2 per cent of aluminum, and comprising not in excess of about 2 per cent interstitial impurities including one or more of the elements nitrogen, carbon, hydrogen and oxygen, which comprises the steps of:

cleansing the said scrap metal to remove scale comprising oxides and nitrides and hydrocarbons,

charging said cleansed scrap metal into a furnace in a vacuum-tight housing evacuated to a pressure not exceeding about 5×10^{-4} torr, said furnace comprising an open-faced hearth section having an inlet end and a casting station spaced apart from and disposed downstream from said inlet end,

melting the said scrap metal charge in said furnace by electron beam bombardment at the inlet end of said hearth section thereby causing said molten charge to drip down onto said open-faced hearth section to form a stream flowing along said hearth section in the direction of said casting station,

exposing said molten scrap stream flowing along said hearth section to further electron beam bombardment at one or more points spaced apart from said inlet end causing the higher vapor pressure elements thereof including at least a portion of said aluminum to become volatilized and distilled off, and

collecting the remaining portion of said molten scrap stream in said casting station permitting it to flow into and solidify in a mold.

3,933,474
LEECH ALLOYING

John L. Ham, Wellesley, and John G. Gorsuch, Brockton, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Mar. 27, 1974, Ser. No. 455,201
Int. Cl.² C22B 4/00
U.S. Cl. 75—10 R **15 Claims**

1. Alloy production method for introducing minority alloying ingredients of higher volatility and lower melting point into a majority metallic component comprising,

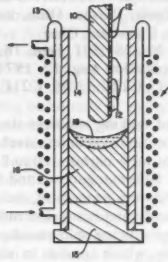
mixing powders of the alloying ingredients with powders of the majority metal and forming coherent compacts of such mixtures as patches,

melting and resolidifying the majority metal to form an elongated bar of the majority metal as a first melt ingot,

applying said patches as an axial array along the surface of said bar, and

re-melting the patched bar progressively along its length and resolidifying the melt as a final ingot to controllably and continuously introduce the alloying ingredients and

majority metal into the melt with the majority metal content of the patches acting as a wick during melting, and to homogenize the dispersion of alloying ingredients



throughout the majority metal in the final ingot and predictably maintain desired proportions of alloy ingredients.

3,933,475

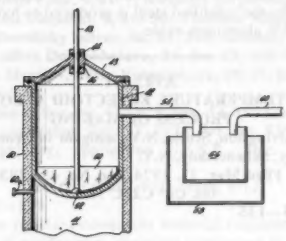
EXTRACTION OF COPPER FROM COPPER SULFIDES

Rollan Swanson, Eureka, Nev. 89316

Continuation-in-part of Ser. No. 467,099, May 6, 1974. This application Nov. 11, 1974, Ser. No. 522,448

Int. Cl.² C22B *15/00*

U.S. Cl. 75—21 **11 Claims**



1. A process for recovering copper from a sulfidic ore thereof, comprising: mixing and fusing said ore under vacuum in the absence of water, CO_2, and oxygen with at least a stoichiometric amount of a non-saturated sulfide of sodium or potassium at a temperature between about 210°C and 360°C thereby forming a melt of copper metal, copper oxides, and a more saturated sulfide of said sodium or potassium and separating said copper from said melt.

3,933,476

GRAIN REFINING OF ALUMINUM

Kuldip S. Chopra, Grand Island; William D. Forgeng, Niagara Falls, and Nicholas J. Pappas, Snyder, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,157

Int. Cl.² C22C *21/00*

U.S. Cl. 75—68 R **6 Claims**

6. An addition agent for refining aluminum, base metal consisting essentially of compacted blended mixture of titanium, aluminum and KBF_4 wherein the titanium and boron contents are in proportions which intersect in region (E) of

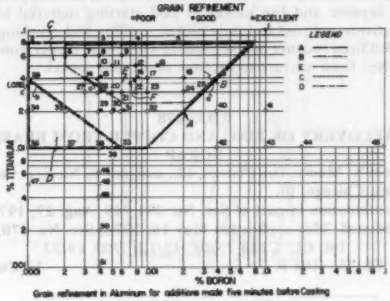


FIG. 1 and the aluminum content is from about one-tenth to 4 times the amount of the titanium content.

3,933,477

METHOD OF PRODUCING FERRO-NICKEL OR METALLIC NICKEL

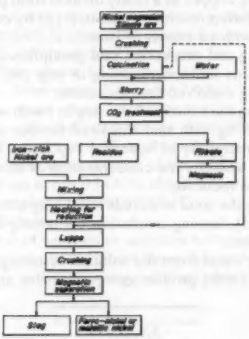
Yohta Sato, Tokyo; Masakata Matsuda; Yukio Ohi, both of Miyazu, and Toyomi Matsumori, Miyazu, all of Japan, assignors to Nippon Yakin Kogyo Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 40,545, May 26, 1970, Pat. No. 3,765,873. This application July 5, 1973, Ser. No. 376,403

Claims priority, application Japan, Feb. 2, 1970, 45-8428; Feb. 9, 1970, 45-10906. The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.

Int. Cl.² C22B *23/06*

U.S. Cl. 75—82 **8 Claims**



1. A method of refining nickel by reducing iron-rich starting material containing nickel which is substantially free from silica, comprising mixing said starting material with silica which is substantially free from magnesium and carboneous reducing agent in a reaction vessel to form a mixture containing at least about 13% silica, heating said mixture so as to produce a reducing atmosphere in said vessel comprising carbon dioxide and carbon monoxide in a ratio of

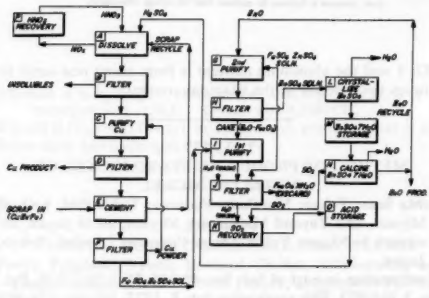
$$\frac{CO}{CO + CO_2}$$

of 1.6% to 90%, firing said mixture at 900° to 1,300° C without melting said mixture thereby causing the iron in said starting material to compound with said silica to form difficulty reducible fayalite and the nickel in said starting material to be selectively reduced to crude nickel, cooling and crushing the cooled fired mixture and separating said crude nickel from the crushed fired mixture to recover said crude nickel.

3,933,478
RECOVERY OF ZINC AND COPPER FROM BRASS SCRAP

Robert N. Moore, Des Plaines, Ill., assignor to Nicosep Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 391,949, Aug. 27, 1973, abandoned. This application May 16, 1974, Ser. No. 470,624
Int. Cl.² C22B *15/08, 15/12, 7/00, 19/22*
U.S. Cl. 75—101 R **12 Claims**



1. A process for recovering copper values from a copper-bearing feed material which process comprises:

a. leaching said copper out of said feed material by treating with aqueous sulfuric acid, in the presence of nitric acid as a promoter, to produce a solution containing copper ions;

b. cementing copper as a finely divided solid precipitate out of the solution resulting from step (a) by contacting said solution with an excess of iron;

c. separating and recovering said precipitated copper from the aqueous solution resulting in step (b), said solution containing dissolved ferrous sulfate;

d. contacting the solution from step (c) with solid ZnO, said ZnO reacting with said dissolved ferrous sulfate to produce a precipitate of hydrated Fe_2O_3 and zinc sulfate in solution, whereby the concentration of ferrous sulfate in solution is reduced;

e. removing the solid materials remaining after the reaction in step (d), leaving a solution containing dissolved zinc sulfate; and

f. removing water from the solution resulting in step (e) to produce a solid product comprising zinc sulfate.

3,933,479
VANADIUM STABILIZED MARTENSITIC STAINLESS STEEL

Joseph D. Defilippi, Allegheny Township, Westmoreland County, and George A. Ratz, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1974, Ser. No. 513,699
Int. Cl.² C22C *38/46*
U.S. Cl. 75—128 V **3 Claims**

1. A martensitic stainless steel having an excellent combination of strength and toughness consisting essentially of 0.01 to 0.15% carbon, 1.00% maximum silicon, 10 to 13% chromium, 2.0 to 5.0% nickel, 0.05 to 0.20% vanadium, and a remainder of iron and normal residual impurities.

3,933 480
METHOD OF MAKING STAINLESS STEEL HAVING IMPROVED MACHINABILITY

Vijayakumar A. Tipnis, Parma, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 289,591, Sept. 18, 1972, Pat. No. 3,846,189. This application Aug. 12, 1974, Ser. No. 496,459
Int. Cl.² C22C *33/00;* **C21C** *7/00*
U.S. Cl. 75—129 **10 Claims**

1. In a method of making stainless steel which comprises producing, in molten state, a stainless steel melt which consists essentially of 0.01 to 1.2% carbon, 10 to 27% chromium, 0 to 22% nickel, 0.3 to 10% manganese, and further elements as specified in the following procedure, balance iron and incidental impurities, and solidifying said molten stainless steel, the procedure for producing said stainless steel to have improved machinability, which consists in incorporating into the molten steel of said melt at the end of its being produced:

1. amounts of sulfur and of an element or elements selected from the class consisting of selenium and tellurium for establishing in the solidified steel a content of 0.15 to 0.7% sulfur and a total of 0.03 to less than 0.15% of said selected element or elements, to produce in said solidified steel a distribution of globular inclusions which are predominantly provided by manganese, sulfur, and said selected element or elements; and

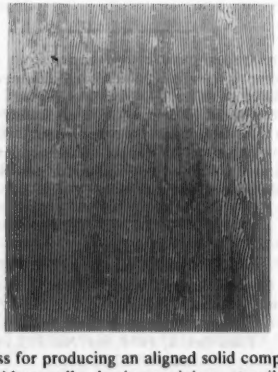
2. deoxidizing-agent-containing material for deoxidizing the molten steel of said melt, the deoxidizing agent or agents of said material being an element or elements selected from the group consisting of silicon and the rare earth elements;

said material being characterized by absence of aluminum in that the maximum content thereof is an amount that would add 0.003% aluminum to the melt and said melt being maintained substantially free of aluminum oxide, whereby the solidified steel is produced to have less than 0.0025% aluminum oxide.

3,933,481
HIGH-TEMPERATURE EUTECTOID ALLOY AND PROCESS OF MAKING

James D. Livingston, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1974, Ser. No. 453,283
Int. Cl.² C22C *19/02*
U.S. Cl. 75—135 **4 Claims**



1. A process for producing an aligned solid composite of a Co-Si eutectoid type alloy having a minimum tensile strength at 900°C of 50,000 psi in an inert atmosphere, said alloy having a transformation temperature at which it transforms

from a single phase solid to a solid of at least two phases, which comprises forming a melt of a $Co_{3-x}M_xSi_{1-y}N_y$ alloy where Co and Si can vary from the Co_3Si eutectoid composition by about 1 atomic %, where M represents elements substituting for Co and is a member of the group consisting of Ni, Cr, Fe, Mn, Cu, Ta, Mo, W, Ti and alloys thereof and where x ranges up to about 0.6, where N represents elements substituting for Si and is a member of the group consisting of Ge, Sn, Al, Ga, In and alloys thereof and where y ranges up to about 0.2, unidirectionally cooling said melt through a thermal gradient ranging from 50°C/cm to 3,000°C/cm at a velocity ranging from 0.05 cm/hr to 20 cm/hr which produces a single phase solid consisting essentially of elongated columnar macro-grains aligned substantially parallel to each other before reaching said transformation temperature, said macro-grains having an average diameter larger than 10 microns, and continuing unidirectionally cooling said macro-grain solid through the same thermal gradient at the same velocity through said transformation temperature directionally transforming said single phase solid into an aligned solid composite consisting essentially of at least two phases, the ratio of said thermal gradient to said velocity being greater than 150°C/cm²/hr, said phases being in the form of substantially uniform alternating lamellae substantially parallel to each other and to the thermal gradient and having an average interlamellar spacing ranging from about 0.2 micron to 3 microns and being substantially uniformly distributed throughout said composite, said composite being substantially or completely free of dendrites.

3,933,482

WEAR-RESISTANT COMPOSITE MATERIAL

Daniil Andreevich Dudko, ulitsa Anri Barbjusa, 22/27, kv. 143; Grigory Valentinovich Samsonov, ulitsa Vladimirskaya, 51-53, kv. 43; Boleslav Ivanovich Maximovich, ulitsa Anri Barbjusa, 22/26, kv. 99; Vitaly Ivanovich Zelenin, ulitsa Ezhena Potie, 9, kv. 7; Alexandr Sergeevich Klimanov, Bulvar Lesi Ukrainki, 9, kv. 50; Vladimir Nikolaevich Potseluiko, Darnitsky bulvar, 4a, kv. 144; Gennady Vasilievich Trunov, ulitsa Dobrokhotova, 24, kv. 63, and Vasily Mikhailovich Sleptsov, ulitsa Vyborgskaya, 80/17, kv. 55, all of Kiev, U.S.S.R.

Continuation of Ser. No. 424,075, Dec. 12, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,155

Claims priority, application U.S.S.R., Dec. 12, 1972, 1855761

Int. Cl.² C22C *9/05, 9/06, 9/12*

U.S. Cl. 75—159 **4 Claims**

1. A wear-resistant composite material consisting of 40–80 volume % of a refractory chemical compound in particulate form with a size of 0.3–2 mm and consisting essentially of, by weight, 7–30% chromium, 40–60% titanium and 30–40% boron; and 20–60 volume % of an alloy matrix consisting essentially of, by weight, 10–35% nickel, 10–35% manganese and the balance being copper.

3,933,483

SILICON-CONTAINING NICKEL-ALUMINUM-MOLYBDENUM HEAT RESISTING ALLOY

Noboru Komatsu; Takatoshi Suzuki; Nobuyuki Yamamoto, and Yukikazu Tsuzuki, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

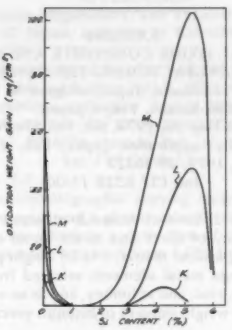
Continuation-in-part of Ser. No. 376,954, July 6, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,251

Claims priority, application Japan, July 14, 1972, 47-70960

Int. Cl.² C22C *19/03*

U.S. Cl. 75—170 **11 Claims**

1. A heat resisting alloy consisting essentially of a basic constituent; and an additive of silicon in the range of 0.5–2.5% by weight of the total alloy; said basic constituent comprising nickel, aluminum and molybdenum in the following percentage by weight of the basic constituent: nickel 65–85%, aluminum 5–15% and molybdenum 10–20%.



3,933,484

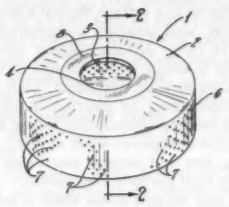
COBALT-BASE ALLOY

Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 31, 1974, Ser. No. 475,220

Int. Cl. C22c *19/00*

U.S. Cl. 75—171 **10 Claims**



1. A composition of matter consisting essentially of the following elements in amounts expressed in weight percent:

Chromium — from about 25 to about 36
Nickel — from about 3.5 to about 13
Wolfram — from about 3 to about 10.5
Tantalum — from about 1.4 to about 6.5
Zirconium — from about 0.005 to about 0.02
Silicon — from about 0.05 to about 2
Carbon — from about 0.35 to about 0.95
Boron — from about 0.001 to about 0.1
Iron — from about 0.01 to about 12
Cobalt — Balance

the weight ratio of wolfram to tantalum being within the range of from about 1 to about 5.5 and the weight ratio of zirconium to boron being within the range of from about 0.05 to about 35.

3,933,485

ELECTRICAL CONTACT MATERIAL

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Tokyo, Japan

Filed May 29, 1974, Ser. No. 474,173

Claims priority, application Japan, July 20, 1973, 48-80705; Nov. 26, 1973, 48-131740

Int. Cl.² B32B *15/00*

U.S. Cl. 75—173 A **4 Claims**

1. Electrical contact materials comprising an alloy having metal oxides precipitated therein as the result of internal

oxidation and being composed of about 5 to about 10% by weight of tin, and 1.0 to 6% by weight of indium, the balance being silver.

3,933,486

SILVER-METAL OXIDE COMPOSITE AND METHOD OF MANUFACTURING THE SAME

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,704

Claims priority, application Japan, Feb. 12, 1974, 49-16226; Feb. 12, 1974, 49-16227

Int. Cl.² B32B *15/00*

U.S. Cl. 75—173 A 3 Claims

1. An electrical contact material obtained by internally oxidizing an alloy of silver and solute metal elements, said alloy comprising a silver matrix, 5 to 20 weight percent of one or more of solute metal elements selected from the group consisting of tin, zinc, and antimony, and as an essential material, 0.01 to 1.0 weight percent of bismuth precipitated in the alloy as oxides.

3,933,487

IMAGING COMPOSITION FOR PHOTOELECTROPHORETIC IMAGING SYSTEM

Robert L. Cowley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,337

Int. Cl.² G03G *17/04*

U.S. Cl. 96—1 PE 11 Claims

1. The method of photoelectrophoretic imaging comprising:

a. providing an imaging donor sheet comprising a substrate having adhered to a surface thereof a layer of an imaging composition, said imaging composition comprising a plurality of finely divided colored particles and from about 0.5% to about 10% by weight of thixotropic additive particles in a carrier liquid, each of said colored particles comprising an electrically photosensitive pigment, said imaging composition having a viscosity above about 10,000 centipoises when at rest;

b. providing first and second electrodes at least one of which is at least partially transparent;

c. attaching said imaging donor sheet to said first electrode with the free surface of said donor sheet substrate adjacent the outer surface of said first electrode;

d. contacting said imaging composition layer with the surface of said second electrode so as to apply a shearing force to said composition thereby reducing the viscosity of said composition to from about 600 to about 1000 centiposes; and

e. substantially simultaneously exposing said imaging composition to an image through said at least partially transparent electrode with a source of activating radiation while subjecting said composition to an applied electric field whereby an image is formed.

3,933,488

INFORMATION DISPLAY METHOD

Yasuhiro Noguchi; Hisatake Ono, and Tsutomu Sugisaki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

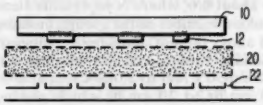
Filed May 16, 1973, Ser. No. 361,004

Claims priority, application Japan, May 17, 1972, 47-48920

Int. Cl.² G03G *13/06*

U.S. Cl. 96—1 R 24 Claims

1. An information display method wherein a component chemiluminescent system is caused to chemiluminesce on a support which comprises forming an image on a support of the components of the chemiluminescent system lacking at least one essential component to cause chemiluminescence by incorporating said components lacking said one essential component in a heat-sensitive layer on a recording material capable of transmitting infrared rays, bringing said layer in contact with an original having varying absorption for infrared rays, subjecting said layer to transmitted exposure or reflected exposure of light including infra-red rays in imagewise fashion from said original and removing exposed or non-exposed



portions of said layer to form an image, and contacting said image with the lacking component or components of the chemiluminesent system to cause said image to chemiluminesce selectively to display information on the support based on a difference in luminescence between the chemiluminescent image and the non-image portion.

3,933,489

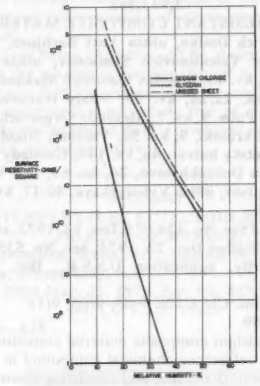
ELECTROSTATIC REPRODUCTION PROCESS EMPLOYING NOVEL TRANSFER PAPER

Wally Z. Walters, West Springfield, Mass., assignor to Preco Corporation, West Springfield, Mass.

Division of Ser. No. 237,797, March 24, 1972, Pat. No. 3,873,354. This application Feb. 21, 1974, Ser. No. 444,296

Int. Cl.² G03G *13/16*, *13/22*

U.S. Cl. 96—1.4 9 Claims



1. In the method of producing a visual image on a copy member comprising the steps of forming a latent electrostatic image on an electrostatically chargeable, photoconductive member by producing a patterned distribution of electrical charges thereon; applying to said photoconductive member a finely divided, pigmented toner which will adhere to those areas of the member where a charge is present; transferring said toner from said photoconductive member to an image receiving surface of an uncharged copy member made of paper; and heating the copy member to fuse the toner thereto in a high temperature environment in which the relative humidity ranges down to 10 percent or lower, the improvement wherein the toner is transferred to a copy member which is resistant to the build-up of static charges on its image receiving surface in the low humidity, high temperature environment in which the copy member is located while the toner is fused thereto and which comprises means for making said image receiving surface counteractive to the retention of static charges which are transferred with said toner particles

to said image receiving surface and a web of cellulosic material, said means being an electrical conductivity imparting additive distributed on or in the web in an amount sufficient to reduce the surface resistivity of the image receiving surface to from not more than 3×10^{11} ohms/square at a relative humidity of 25 percent up to not more than 60×10^{11} ohms/-square at a relative humidity of 10 percent to thereby facilitate the dissipation of static charges therefrom in said low humidity, high temperature environment and thereby keep said charges from remaining on said image receiving surface and creating a tendency for the copy member to stick to another charged copy member or to parts of the copy making apparatus.

3,933,490
IMPROVEMENTS IN TRANSFER ELECTROPHOTOGRAPHY

Hiroshi Tsuchiya, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 301,220, Oct. 26, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,837
Claims priority, application Japan, Nov. 4, 1971, 46-87762
Int. Cl.² G03G *13/14, 13/10*
U.S. Cl. 96—1.4 **19 Claims**

1. For use in transfer electrophotography, a method of optimizing the efficiency of transfer, to a transfer material, of developed images obtained by developing electrostatic images formed on the photosensitive member for electrophotography by a liquid developer, which comprises the steps of controlling the depth of the liquid developer on the surface to a value in the range of 5–30μ prior to transfer, and then transferring the developed images to the transfer material having an oil absorption coefficient larger than 50 seconds and a smoothness determined by Beck tester in the range of 30–150 seconds in such a manner that the 5–30μ controlled thickness of the developer on the photosensitive member is reduced to a value in the range of 2–15μ.

3,933,491
IMAGING SYSTEM

William L. Goffe, Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 837,592, June 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 553,837, May 31, 1966, abandoned, and a continuation-in-part of Ser. No. 837,591, June 30, 1969, abandoned. This application Sept. 20, 1971, Ser. No. 181,990
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 **1 Claim**

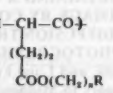
1. An imaging member comprising a substrate and a fracturable layer comprising migration marking material wherein said fracturable layer is contiguous the surface of and at least partially embedded in and contacting a photoconductive insulating softenable layer comprising homogeneous photoconductive softenable material, said photoconductive insulating softenable layer material substantially devoid of fracturable layer material and said fracturable layer is overcoated with another layer of softenable material.

3,933,492
NOVEL PHOTOCONDUCTIVE SUBSTANCES AND THEIR APPLICATION

Shoji Maruyama, Sagamibara, and Takamichi Enomoto, Sendai, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 335,744, Feb. 26, 1973, abandoned. This application July 5, 1973, Ser. No. 376,747
Claims priority, application Japan, Feb. 23, 1972, 47-19260; Germany, Feb. 20, 1973, 2308332; United Kingdom, Feb. 23, 1973, 8916/73; Canada, Feb. 22, 1973, 164355
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 **10 Claims**

1. An electrophotographic copying material comprising a conductive support and a photoconductive layer containing a photoconductor which is a derivative of polyglutamic acid having a molecular weight of from 1,000 to 100,000 and the formula:



wherein

R represents polynuclear aromatic or heterocyclic nitrogen groups each containing up to about sixteen carbon atoms, and

n is the integer 1 or 2.

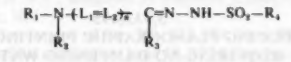
3,933,493
AMIDRAZONES AS DYE COMPONENTS AND DEVELOPER SCAVENGERS IN DIFFUSION TRANSFER MATERIALS AND PROCESSES

Yasushi Ohyama, and Hideo Sumitani, both of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed July 3, 1972, Ser. No. 268,264
Claims priority, application Japan, July 2, 1971, 46-48756
Int. Cl.² G03C *7/00, 5/54, 1/40*
U.S. Cl. 96—29 D **9 Claims**

1. A quick diffusion transfer process for forming a color positive image not requiring fixing thereof comprising:

a. imagewise exposing a photosensitive material which comprises at least two light-sensitive silver halide emulsion layers of different optical sensitivity separated by an intermediate layer, on a support, each of said layers containing an amidrazone compound represented by the formula:



wherein L_1 and L_2 each represents —CH= or —N=; *n* is 0 or 1; R_1, R_2, R_3 and R_4 each represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, an alkylaryl group or said groups containing an O, S or N atom or said groups substituted by a halogen atom, a carboxylic acid residue or a sulfonic acid residue; wherein said R_1 may form a heterocyclic ring with said R_2; wherein said R_2 may form a ring with R_3 together with said —L= L_2—; wherein the amidrazone compounds in said silver halide emulsion layers have a ballasting group of at least 10 carbon atoms substituted in said R_4; and wherein the amidrazone compound present in said intermediate layer have a ballasting group of at least 10 carbon atoms substituted in said R_1, R_2 or R_3; each of the amidrazone compounds in each of said layers thereby having a diffusion-resistant property;

b. subjecting the exposed photosensitive material to a black and white development;

c. intimately contacting that surface of the photosensitive material away from the support with an image-receiving layer and, while contacted, subjecting the same to an

oxidation treatment in a processing solution containing a ferricyanide, said image-receiving layer containing, dispersed in a binder therefor, a diffusion-resistant color coupler capable of oxidative coupling with the diffusable intermediate oxidation product of said amidrazone compounds formed by the oxidation treatment in said silver halide emulsion layers of said photosensitive material, whereby, said diffusable intermediate oxidation products diffusion-transfer from said silver halide emulsion layers into said image-receiving layer corresponding to said imagewise exposure and couple with said color coupler to form a color image in said image-receiving layer corresponding to said imagewise exposure; and

d. removing said photosensitive material from contact with said image-receiving layer.

3,933,494

METHOD FOR OBTAINING A COLOR CONTRAST PHOTOGRAPHIC IMAGE BY COLOR DEVELOPMENT AND SILVER SALT DIFFUSION TRANSFER PROCESSING OF ONE PHOTOGRAPHIC ELEMENT

Vinicio Busatto, Savona, and Luigi Franchi, Ferrania, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 8, 1973, Ser. No. 413,966
Claims priority, application Italy, Nov. 15, 1972, 54051/72
Int. Cl.² G03C *5/54, 7/00, 1/48, 1/40*
U.S. Cl. 96—29 R **13 Claims**

1. A method for the formation of a color contrast photographic image consisting of processing an exposed photographic material including:

a. a base;

b. at least one layer of a silver halide photographic emulsion dispersed in a hydrophilic colloidal binder, reactively associated with at least one color coupler capable of yielding a substantially blue dye upon development with a p-phenylene diamine developer;

c. at least one hydrophilic colloidal binder receptive layer reactively associated with said emulsion layer; containing dispersed silver condensation nuclei for the formation of substantially yellow colored colloidal silver by development with an aqueous alkaline solution comprising:

d. a p-phenylene diamine developer, and

e. a carrying agent for silver halide said condensation nuclei and said coupler being able to give rise to two different colors to form a color contrast image, yellow from the condensation nuclei and blue from the coupler, with (b) and (c) on the same side of said base.

3,933,495

PRODUCING PLANOGRAPHIC PRINTING PLATE REQUIRING NO DAMPENING WATER

Asaji Kondo; Shizuo Miyano, and Kenichiro Yazawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 14, 1973, Ser. No. 359,959
Claims priority, application Japan, May 12, 1972, 47-47320
Int. Cl.² G03F *7/02*
U.S. Cl. 96—33 **2 Claims**

1. A process for producing a planographic printing plate, which does not require dampening water for printing, which comprises image-wise exposing through a positive film a presensitized plate comprising a support, a layer formed on said support of a photosensitive substance prepared by the reaction at a pH of not more than 7.5 of the condensation product of p-diazo-phenylamine and formaldehyde with 2-hydroxy-4-methoxybenzopheneone-5-sulfonic acid and a layer formed on said photosensitive layer of a one package silicone rubber curable at room temperature, heating said plate before or after exposure at a temperature not less than 120°C and treating said exposed presensitized plate with a treating solution of γ-butyrolactone or methyl cellosolve capable of removing only the non-exposed portion of said exposed presensitized plate.

3,933,496

DIRECT-POSITIVE PHOTOGRAPHIC MATERIAL AND METHOD FOR ITS PRODUCTION

Konstantin Nikolaev Kolev, and Jordan Petrov Malinowski, both of Sofia, Bulgaria, assignors to Zlafop pri Ban, Bulgaria

Filed Nov. 15, 1973, Ser. No. 416,009
Claims priority, application Bulgaria, Nov. 15, 1972, 21873
Int. Cl.² G03C *5/24*
U.S. Cl. 96—48 R **6 Claims**

1. A photographic material capable of yielding on imagewise exposure to radiation a direct positive image, which material comprises: a non-metallic carrier base; and on the carrier base, a layer of metal salt selected from the group consisting of halides of divalent tin, divalent lead, trivalent titanium and stannous sulfide and a layer of at least one photosensitive compound selected from the group consisting of the halides of silver, cadmium, lead, bismuth, thallium, zinc, copper and mercury and chalcogenides or oxides of arsenic, lead, cadmium, and antimony, said photosensitive compound being capable when activated upon exposure to radiation of reacting chemically with said metal salt layer in a manner such that in any region exposed to radiation the metal salt layer loses its catalytic activity to a metallization baths, and in any region not exposed to radiation the said metal salt layer remains intact, thereby forming a positive latent image which is visualized on intensification by chemical metallization.

3,933,497

PHOTOSENSITIVE AZIDO PROCESSES

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 313,378, Dec. 8, 1972, Pat. No. 3,844,793, which is a continuation-in-part of Ser. No. 82,129, Oct. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 29,527, March 17, 1970, abandoned. This application June 27, 1974, Ser. No. 483,483
Int. Cl.² G03C *1/52, 1/72, 5/18*
U.S. Cl. 96—49 **9 Claims**

1. A dry imaging process comprising the consecutive steps of:

a. imaging a light sensitive material comprising a suitable photographic substrate having a coating deposited thereon, said coating consisting essentially of a permeable film-forming plastic having a photosensitive, volatile, peri-substituted naphthalene azido compound dispersed therein wherein the azido compound has one of the following substituents oriented peri to the azido group: amino, hydroxy azido, trifluoroacetamido, or

wherein R is lower alkyl having from C_1–C_6 or phenyl by irradiating with patterned activating radiation to produce a visible image; and

heating the material to evaporate the unreacted naphthalene azido compound.

3,933,498

FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING A BLEACH INHIBITING COMPOUND AND A DMIN MAINTAINER COMPOUND

Leewellyn C. Fischer, Fairport, and Heman Dowd Hunt, Webster, both of N.Y., assignors to E. I. Du Pont de Nemours and company, Wilmington, Del.

Filed Sept. 28, 1973, Ser. No. 403,263

Int. Cl.² G03C *5/24, 1/36, 1/34, 1/28*

U.S. Cl. 96—64 **4 Claims**

1. In a Herschel reversal type direct positive silver halide emulsion having prefogged silver halide grains containing a desensitizing dye, the improvement comprising a combination of a bleach inhibiting compound which retards bleaching of fogging nuclei by short wavelength radiation and a different Dmin maintainer compound which inhibits residual latent image formation said bleach inhibiting compound being selected from the group consisting of 5-nitrobenzotriazole, 5-chlorobenzotriazole, 6-amino-2-(methylthio)-benzothiazole, 6-methyl-2-(p-amino-phenyl)-benzothiazole, 2-amino-6-methylbenzothiazole, 2-amino-6-methoxybenzothiazole, 2-amino-5,6-dimethylbenzothiazole, 6-amino-2-methyl-7-nitrobenzothiazole, 6-amino-4-mercaptobenzothiazole, 2-amino-5-nitrothiazole, 2-aminothiazole, 2-amino-4-methylthiazole, 2-amino-4,5-dimethylthiazole, 2-amino-5-(p-nitrophenyl-sulfonyl)-thiazole, 2-acetaminothiazole, 2-amino-4-phenyl-5-ethylthiazole, 2-amino-4-(chloromethyl) thiazole-HCl, 2-amino-5-nitrothiazole, 2,4-dihydroxythiazole-5-acetic acid, 2-amino-5-bromothiazole, 2-amino-5-ethyl-4-phenyl-oxazole, 4-amino-6-chloro-5-nitropyridine, 5-aminoindiazole, 4-benzoylimino-3-t-butyl-1,3-thiazilidine-2-thione, 4-benzoylimino-3-phenyl-1,3-thiazilidine-2-thione, and said Dmin maintainer compound being selected from the group consisting of 2-amino-5-nitropyridine, 2-amino-4-methyl-2-nitropyridine, 2-amino-4-methyl-3-nitropyridine, 2-amino-3-nitropyridine, pyromellitimide, 5-nitroindazole, 6-nitroindazole, 3-chloro-5-nitroindazole, 3-chloro-6-nitroindazole, 5-nitrobenzotriazole, 6-chlorobenzotriazole, benzotriazole, 3-amino-1H-1,2,3,-triazole, 2-amino-5 -nitrothiazole, 2-methyl-6-nitrobenzothiazole, 2-mercapto-6-nitrobenzothiazole, 2-acetamido-5-(p-nitrophenylmercapto)-thiazole, 6-amino-2-methyl-7-nitrobenzothiazole, 2-amino-5-chlorobenzoxazole, 2-nitrothiophene, 5-nitrobenzimidazole, 5-nitro-2-benzimidazole-thiol, 8-nitro-quinoline, m-nitrobenzamidine, 5-nitroanthraquinone sulfonic acid and p-nitrobenzenediazonium fluoborate.

3,933,499

PRINTING PLATE COMPRISING DIAZO-BOROFLUORIDE AND DIAZO RESIN LAYERS

Richard T. Traskos, Brooklyn, Conn., assignor to Lith-Kem Corporation, Lynbrook, N.Y.

Continuation-in-part of Ser. No. 288,043, Sept. 11, 1972, Pat. No. 3,837,858. This application July 24, 1974, Ser. No. 491,393. The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.² G03F *7/02*

U.S. Cl. 96—68 **10 Claims**

1. A planographic printing plate having:

a hydrophilic substrate;

a first coating containing a water soluble light reactive diazo resin on said substrate; and

a second coating containing a photosensitive solvent-soluble diazo-borofluoride salt and an organophilic hydrophobic water insoluble resin over and in intimate contact with said diazo resin, said organophilic hydrophobic water insoluble resin being less than 50% by weight of said second coating;

said plate being developable by water or aqueous solution whereby areas of the diazo resin unexposed to light and areas of the diazo-borofluoride salt thereover are washed away to define hydrophilic oleophobic non-printing areas, and areas of the diazo resin exposed to light and the diazo-borofluoride salt thereover define hydrophobic oleophilic printing areas.

3,933,500

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

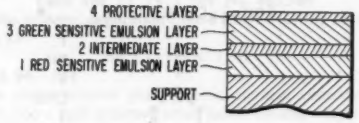
Keisuke Shiba; Nobuo Furutachi; Harumi Katsuyama; Takeshi Hirose; Toshiaki Aono, and Shoji Ishiguro, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 25, 1974, Ser. No. 454,525

Claims priority, application Japan, Mar. 23, 1973, 48-33238

Int. Cl.² G03C *1/76, 3/00, 7/00*

U.S. Cl. 96—74 **11 Claims**



1. A color photographic silver halide light-sensitive material which comprises a support having thereon at least two light-sensitive layers, at least one of said layers containing a compound capable of coupling with an oxidation product of a color developing agent and in which a splitable hetero aromatic ring containing a triazole or diazole ring is connected to the carbon atom in the coupling position, through the nitrogen atom in the 1-position of said triazole or diazole ring.

3,933,501

PHOTOGRAPHIC ELEMENTS CONTAINING COLOR-FORMING COUPLERS HAVING AND INHIBITING EFFECT UPON THE REACTIVITY OF COMPETING COUPLERS

Robert G. Cameron, North Chili, and Dan Neuberger, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

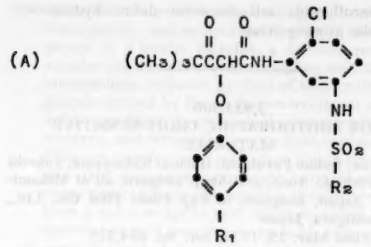
Continuation-in-part of Ser. No. 419,573, Nov. 28, 1973, abandoned. This application June 10, 1974, Ser. No. 478,123

Int. Cl.² G03C *1/76*

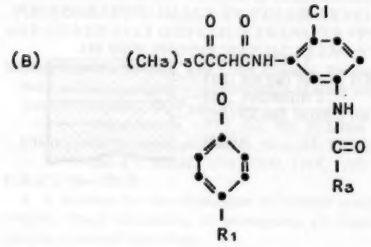
U.S. Cl. 96—74 **29 Claims**

1. In a photographic element comprising a support coated with at least two silver halide emulsion layers; each of said emulsion layers being preferentially sensitive to different regions of the visible spectrum and each of said emulsion layers being associated with at least one coupler compound which, upon reaction with oxidized primary aromatic amine color developing agent, forms an image dye; a first emulsion layer sensitive to the relatively shorter wavelength region of the visible spectrum overlying the second emulsion layer in said element; said second emulsion containing a cyan dye-forming coupler compound or a magenta dye-forming coupler compound; .

the improvement which comprises, in said element, the presence in said first emulsion layer of a yellow dye-forming coupler compound having a Competitive Reaction Ratio of at most about 1.20; said yellow dye-forming coupler compound being selected from those having one of the structures:

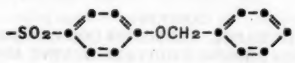
(A) 

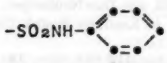
or

(B) 

wherein R_1, R_2 and R_3 can differ and are non-interfering coupler substituent groups; at least one of R_1 and R_2 in structure A and at least one of R_1 and R_3 in structure B being a ballasting group; said R_1 being

-nitro,

 ,

 ,

alkoxy

-NHSO2-alkyl,

,

,

,

-SO2-alkyl, or

-CN, and

said R_2 being

$-C_nH_{2n+1}$, where n is 1 to 30;
-alkaryl;
-aralkyl;
-phenyl; or
alkoxyphenyl,

wherein the groups designated as alkyl and alkoxy contain 1–30 carbon atoms and the alkaryl, aralkyl and alkoxyphenyl groups contain 7–35 carbon atoms.

3,933,502

1,4-BIS(2-ISOPROPYL-6-METHYLANILINO)ANTHRAQUINONE AND A POLYETHYLENE TEREPHTHALATE FILM CONTAINING SAME AS AN X-RAY PHOTOGRAPHIC FILM SUPPORT

Atsuaki Arai; Noburo Hibino, and Kunihira Seto, Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 3, 1973, Ser. No. 385,264
Claims priority, application Japan, Aug. 5, 1972, 47-78473
Int. Cl.² G03C *1/84*
U.S. Cl. 96—84 R **4 Claims**

1. An X-ray photographic material comprising a support having thereon an X-ray sensitive silver halide photographic emulsion, said support comprising a polyethylene terephthalate film containing the compound 1,4-bis(2′-isopropyl-6′-methylanilino) anthraquinone.

3. A photographic silver halide light-sensitive material comprising as a support a polyethylene terephthalate film containing 1,4-bis(2′-isopropyl-6′-methylanilino) anthraquinone.

3,933,503

CARRIER FOR TRANSFERRING IMAGES

Herman Schönberg, Klostergatan 5, 582 23 Linkoping, Sweden

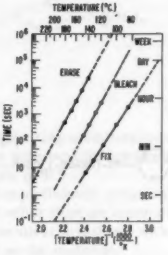
Filed May 6, 1974, Ser. No. 467,508
Int. Cl.² G03C *1/86, 1/78, 1/96*
U.S. Cl. 96—85 **4 Claims**

1. A carrier for transferring images to an image receiver comprising a paper treated with a release agent selected from the group consisting of silicones, polyethylene, and polytetrafluoroethylene, and a transparent binder suspension layer disposed thereon, said binder suspension consisting essentially of a solid suspension in a solvent, said solid comprising a nitrile butadiene rubber obtained by copolymerizing butadiene with acrylonitrile.

3,933,504
PHOTOCHROMIC LITHIUM NIOBATE AND METHOD FOR PREPARING SAME

William Phillips, Princeton, and David Lloyd Staebler, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 345,323, March 27, 1973, Pat. No. 3,799,642.
This application Nov. 19, 1973, Ser. No. 417,385
Int. Cl.² G03C 1/00
U.S. Cl. 96—88 4 Claims



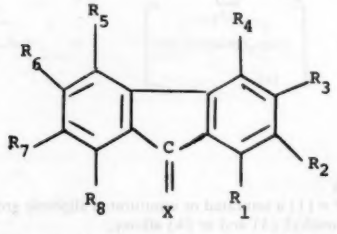
1. Photochromic lithium niobate containing at least about 0.001 mol percent of iron as a first dopant and at least about 0.001 mol percent of a second dopant selected from the group consisting of manganese and copper.

3,933,505
FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSION CONTAINING A NITRO-SUBSTITUTED FLUORENE DESENSITIZER

Keisuke Shiba; Masanao Hinato, and Reiichi Ohi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 18, 1973, Ser. No. 425,747
Claims priority, application Japan, Dec. 18, 1972, 47-126862
Int. Cl.² G03C 1/36
U.S. Cl. 96—101 22 Claims

1. A fogged silver halide photographic emulsion for direct positives, containing 1×10^{-5} to 5×10^{-2} moles per mole of silver halide of a fluorene compound having at least one nitro group as a substituent, which said nitro-substituted fluorene compound has the following general formula (I),



in which X is an oxygen atom or

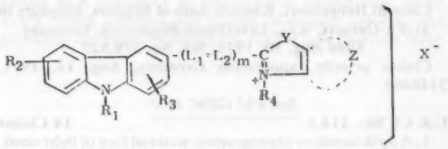
group, and R_1 to R_8 each are a hydrogen atom, an alkyl group, a hydroxyl group, a halogen atom or a nitro group, with at least one of R_1 to R_8 being a nitro group.

3,933,506
SPECTRAL SENSITIZATION OF DIRECT-POSITIVE SILVER HALIDE EMULSIONS

Henri Depoorter, Mortsel, and Jozef Remy Scheilekens, Wilsele, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 29, 1974, Ser. No. 465,369
Claims priority, application United Kingdom, May 18, 1973, 23863/73
Int. Cl.² G03C 1/36
U.S. Cl. 96—101 4 Claims

1. A direct-positive photographic element comprising a support and a light-sensitive silver halide emulsion layer containing fogged silver halide grains wherein the said emulsion layer contains a dye of the formula:



wherein:

R_1 is hydrogen, an alkyl group, an aryl group or an acyl group,

each of R_2 and R_3 represents hydrogen, carboxyl, sulpho, nitro, cyano, halogen, an alkyl group, or an aryl group.

each of L_1 and L_2 represents a methine group,

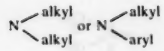
m is 1 or 2,

Y is O, S, Se or

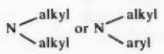
R_4 represents an aliphatic group, or an aromatic group,

X^- represents an anion but does not exist when the molecule itself contains an anionic group, and

Z represents the atoms necessary to close a fused-on benzo- or naphtho-ring having a COR_5 or SO_2R_6 group wherein R_5 is alkyl, aryl, hydroxyl, O-alkyl, NH_2, NH-alkyl, NH-aryl,



and R_6 is alkyl, aryl, NH_2, NH-alkyl, NH-aryl,



and does not include a desensitizing group.

2. A direct-positive photographic element according to claim **1**, wherein the emulsion layer also comprises a nitrobenzylidene or nitrostyryl dye.

3,933,507

PHOTOGRAPHIC LIGHT-SENSITIVE AND HEAT DEVELOPABLE MATERIAL

Anita von Konig, Leverkusen; Helmut Kampfer, Cologne, both of Germany; Eric Maria Brinckmann, Mortsel, and Frans Clement Heugebaert, Kontich, both of Belgium, assignors to AGFA-Gevaert, A.G., Leverkusen-Bayerwerk, Germany

Filed Aug. 10, 1972, Ser. No. 279,523

Claims priority, application Germany, Aug. 12, 1971, 2140462

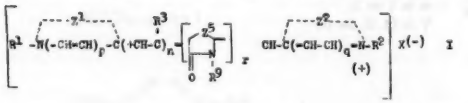
Int. Cl.[2] G03C 1/02

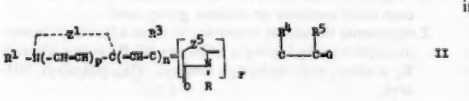
U.S. Cl. 96—114.1 **14 Claims**

1. A light-sensitive photographic material free of light-sensitive heavy metal salts containing

a light-insensitive silver salt selected from the group consisting of silver salt of a long-chain fatty acid, and a silver salt of aliphatic carboxylic acid containing a thioether group;

and the material contains a polymethine sensitizer in a spectrally sensitizing amount selected from those having the following formulae:



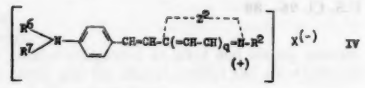


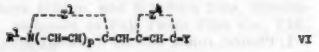
in which

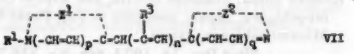
R^1, R^2 = (1) a saturated or unsaturated aliphatic group; (2) cycloalkyl; (3) aryl or (4) alkoxy;

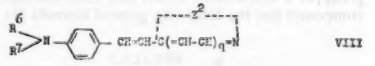
R^3 = hydrogen, phenol or a saturated aliphatic group;

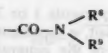
R^4 = hydrogen, cyano, —CO—R^8,



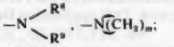








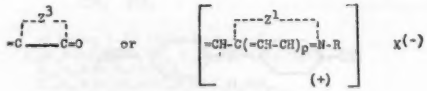
$-COOR^8$;
$R^5 = R^8, OR^8$,



$R^4 + R^5$ together the ring members required for completing an isocyclic or heterocyclic ketomethylene ring;
R^6, R^7 = hydrogen or R^8;
R^8 = a saturated or olefinically unsaturated aliphatic group;
X(-) = an anion other than an anion capable of producing a light-sensitive silver metal salt with the non-light sensitive silver salt in the material;

m = 4, 5, 6;
n = 0, 1, 2;
r, p, q = 0, 1:
Q = O, S;
R^9 = hydrogen, R^8 or aryl;

Z^1, Z^2 = the members required for completing a 5- or 6-membered heterocyclic ring in which the heterocylcic group may contain a condensed benzene or naphthalene ring;
Z^3 = the ring members required for completing an isocyclic or heterocyclic ketomethylene ring;
Z^4 = the members required for completing a 5- or 6-membered isocyclic ring;
Z^5 = S, N—R^9;
Y = a radical of the following formulae:



in a proportion of 0.1 – 2 g of sensitizing dye per mol of the silver salt for spectrally sensitizing the silver salt solely by said sensitizer, whereby the combination of the silver salt and said sensitizer is light-sensitive only in the spectral range of said sensitizer;

and a reducing agent having at least one active hydrogen atom attached to O, N or C, capable of reducing the silver salt in areas exposed to light and causes the development of a visible image in said material by reducing the silver salt when processed with heat after exposure whereby the said combination is sensitive to light in the absence of light-sensitive heavy metal salts.

3,933,508

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIALS

Kinji Ohkubo, and Takao Masuda, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 9, 1973, Ser. No. 358,559
Claims priority, application Japan, May 9, 1972, 47-45696
Int. Cl.² G03C *1/72, 1/02*
U.S. Cl. 96—114.1 **19 Claims**

1. A heat developable light-sensitive material comprising, on a support, (1) an organic silver salt, (2) a light-sensitive silver halide or silver-halide prepared by reacting the organic silver salt with a halide, (3) a reducing agent, (4) a binder, and (5) an overcoat layer overlying components (1)–(4); said components (1)–(4) occurring in a single coated layer over said support; and said overcoat layer consisting essentially of a polymer having a refractive index greater than 1.45 at 20°C, having heat resistance to temperatures greater than about 115°F, being colorless and soluble in organic solvents, and providing increased transparency for the said overcoat layer.

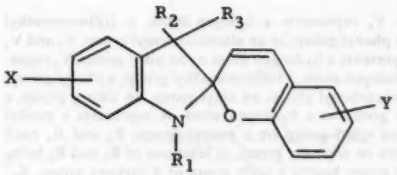
3,933,509

PHOTO-POLYMERIZABLE COMPOSITION CONTAINING AN ACID SALT OF AN INDOLINOBENZOSPIROPYRAN

Yasuhiro Noguchi; Syu Watarai; Chiaki Osada, and Hisatake Ono, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 22, 1973, Ser. No. 390,671
Claims priority, application Japan, Aug. 23, 1972, 47-84383
Int. Cl.² G03C *1/68;* **C08F** *2/46, 8/00;* **C07D** *209/04*
U.S. Cl. 96—115 P **16 Claims**

1. A photo-polymerizable composition comprising (A) a photo-polymerization initiator comprising at least one inorganic or organic acid salt of a Lewis acid or proton acid effective as an initiator for cationic polymerization and an indolinobenzospiropyran represented by the following general formula (I);



(I)

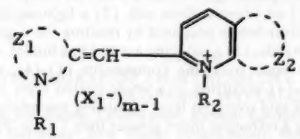
wherein R_1 represents an alkyl group, substituted alkyl group or a phenyl group; R_2 and R_3 each represents an alkyl group or a phenyl group or, when taken together, R_2 and R_3 form a methylene chain $-CH_2-_n$ wherein n is an integer of 4 to 5; X represents a hydrogen atom, a nitro group, a halogen atom, a carboxy group, an alkoxycarbonyl group, an alkyl group or an alkoxy group; and Y represents one or more substituents selected from the group consisting of a hydrogen atom, a nitro group, a halogen atom, a formyl group and an alkoxy group, and (B) at least one cationically polymerizable substance having an ethylenically unsaturated bond or having a cyclic group capable of ring-opening for polymerization.

3,933,510
SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba; Haruo Takei; Akira Sato, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

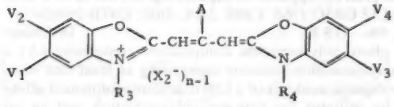
Filed Sept. 4, 1973, Ser. No. 394,016
Claims priority, application Japan, Sept. 4, 1972, 47-88528
Int. Cl.² G03C 1/14
U.S. Cl. 96—124 **11 Claims**

1. A silver halide photographic emulsion which contains in combination at least one pseudocyanine sensitizing dye represented by the following general formula (I);



(I)

wherein Z_1 represents a benzothiazole nucleus or a benzoselenazole nucleus either of which is substituted at the 5-position by a halogen atom, an alkoxycarbonyl group, a cyano group, a trifluoromethyl group, a methylsulfonyl group, an acetyl group or a phenyl group; Z_2 represents the non-metallic atoms necessary to form a benzene nucleus; R_1 and R_2 each represents an aliphatic group, at least one of R_1 and R_2 being an alkyl group having a sulfo group; X_1^- represents an anion; m represents 1 or 2 and, when the dye forms an intramolecular salt, m represents 1; and at least one oxacarbocyanine sensitizing dye represented by the following general formula



(II)

wherein V_1 represents a halogen atom, a trifluoromethyl group, a phenyl group, or an alkoxycarbonyl group; V_2 and V_4 each represents a hydrogen atom or an alkyl group; V_3 represents a halogen atom, a trifluoromethyl group, a phenyl group, an alkoxycarbonyl group, an alkyl group, an alkoxy group, a hydroxy group or a hydrogen atom; A represents a methyl group, an ethyl group or a propyl group; R_3 and R_4 each represents an aliphatic group, at least one of R_3 and R_4 being an alkyl group having a sulfo group or a carboxy group; X_2^- represents an anion; n represents 1 or 2 and, when the dye forms an intramolecular salt, n represents 1; said dyes of the general formula (I) and of the general formula (II) being present in such amounts that the combination exhibits a supersensitizing action.

3,933,511
POLISHES CONTAINING WAX-ANHYDRIDE COMPOUNDS

William J. Heintzelman, and Michael I. Naiman, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 64,570, Aug. 17, 1970, abandoned, which is a division of Ser. No. 607,877, Jan. 9, 1967, Pat. No. 3,590,076, which is a continuation-in-part of Ser. No. 527,075, Feb. 14, 1966, abandoned. This application Dec. 22, 1972, Ser. No. 317,537
Int. Cl.² C09G 1/08; C09D 11/12
U.S. Cl. 106—10 **10 Claims**

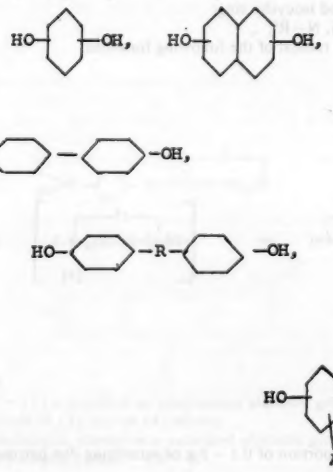
1. An emulsion polish comprising

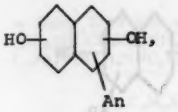
I. water, mineral spirits or a mixture of water and mineral spirits; and

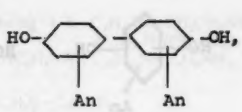
II. A. a wax-maleic compound adduct reaction product of (i) maleic acid, maleic anhydride, citraconic acid, citraconic anhydride, ethylmaleic acid, ethylmaleic anhydride, gultaconic acid, glutaconic acid anhydride, itaconic acid, itaconic acid anhydride, methylitaconic acid, or methylitaconic acid anhydride and (ii) plastic microcrystalline wax, tank bottom microcrystalline wax, solvent extracted microcrystalline wax, Fischer-Tropsch wax, polyalkylene hydrocarbon wax or mixtures thereof, characterized by a melting point of at least about 150°F. and a penetration of less than about 50 (ASTM) TEST METHOD D5-25), or

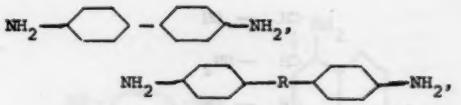
B. said wax-maleic compound adduct reaction product of A coupled with

1. a polyfunctional polyalcohol selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, triethylene glycol, butylene glycol, polyethylene glycol having a molecular weight of about 600, tetramethylene glycol, neopentyl glycol, 2-methyl-1,3-pentanediol, 1,5-pentanediol, hexamethylene glycol, glycerol, polyglycerol, pentaerylthritol, mannitol, trimethylolpropane, trimethylolethane, 1,2,6-hexanetriol, polypentaerythritol, polyallyl alcohol, polymethallyl alcohol,

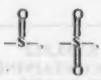


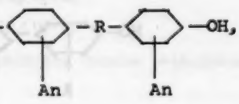


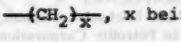




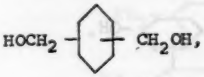
where R is O, S,



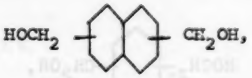


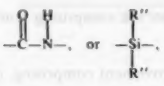


x being 1–4,

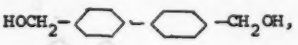


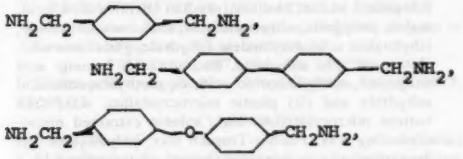
R′ being H or alkyl,

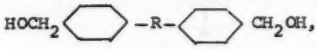




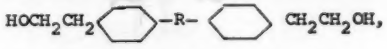
R″ being alkyl,







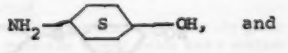
and morpholine,



or

3. a polyfunctional alcohol-amine selected from the group consisting of $NH_2(CH_2)_xOH$, where x is 1–10,

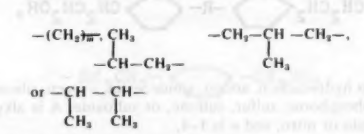
,



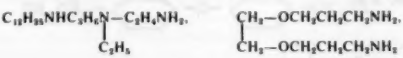
and

where R is hydrocarbon, amino, amide, ester, oxygen, silicon, ketone, phosphorus, sulfur, sulfone, or sulfoxide, A is alkyl, alkoxy, halo or nitro, and n is 1–4, or

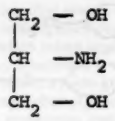
2. a polyfunctional amine selected from the group consisting of a polyamine of the formula $NH_2-(ANH)_n\,H$ where A is



m being 2–10 and n being 1–8,
$C_9H_{17}NH\text{-}CH_2CH_2NH_2$, $C_{14}H_{29}NH\text{-}CH_2CH_2NH_2$,
$C_{16}H_{33}NHCH_2CH_2NH_2$,
$C_{18}H_{35}NHC_3H_6NHC_3H_6NHC_3H_6NH_2$,
$C_{18}H_{35}NHC_3H_6NH_2$, $C_{15}H_{31}NHC_3H_6NH_2$,
$C_{16}H_{31}NHC_3H_6NH_2$,



p-phenylene diamine, m-phenylene diamine, o-phenylene diamine,



3,933,512

CARBON PAPER INKS CONTAINING WAX-ANHYDRIDE COMPOUNDS

William J. Heintzelman, and Michael I. Naiman, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 64,571, Aug. 17, 1970, abandoned, which is a division of Ser. No. 607,877, Jan. 9, 1967, Pat. No. 3,590,076, which is a continuation-in-part of Ser. No. 527,075, Feb. 14, 1966, abandoned. This application Dec. 22, 1972, Ser. No. 317,524

Int. Cl.[2] C09D *11/12*

U.S. Cl. 106—22 11 Claims

1. In a carbon paper ink comprising a mixture of

I. a vehicle oil,

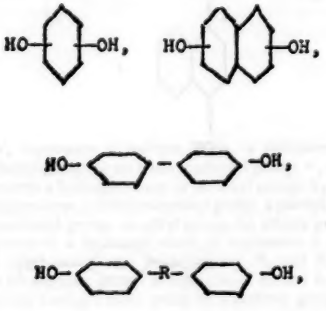
II. a pigment,

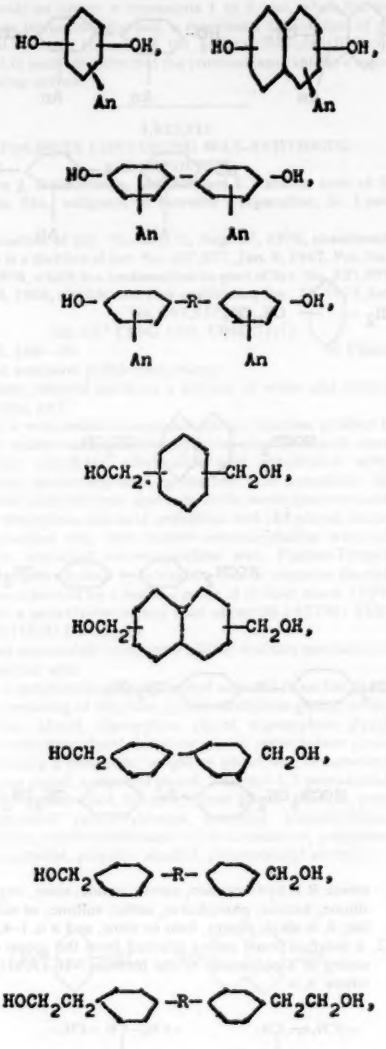
III. a dye, the improvement comprising, in said mixture, an additive

IV. selected from the group consisting of A. a wax-maleic compound adduct reaction product of (i) maleic acid, maleic anhydride, citraconic acid, citraconic anhydride, ethylmaleic acid, ethylmaleic anhydride, glutaconic acid, glutaconic acid anhydride, itaconic acid, itaconic acid anhydride, methylitaconic acid, or methylitaconic acid anhydride and (ii) plastic microcrystalline wax, tank bottom microcrystalline wax, solvent extracted microcrystalling wax, Fischer-Tropsch wax, polyalkylene hydrocarbon wax or mixtures thereof, characterized by a melting point of at least about 150°F. and a penetration of less than about 50 (ASTM Test Method D5-25), the molar ratio of (i) to (ii) being from about 0.9 to about 1.5 and the reaction being carried out at substantially atmospheric pressure under free radical conditions, and

B. said wax-maleic compound adduct reaction product of A coupled with a polyfunctional compound selected from the group consisting of

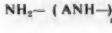
1. a polyfunctional polyalcohol selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, triethylene glycol, butylene glycol, polyethylene glycol having a molecular weight of about 600, tetramethylene glycol, neopentyl glycol, 2-methyl-1,3-pentanediol, 1,5-pentanediol, hexamethylene glycol, glycerol, polyglycerol, pentaerythritol, mannitol, trimethylolpropane, trimethylolethane, 1,2,6-hexanetriol, polypentaerythritol, polyallyl alcohol, polymethallyl alcohol,



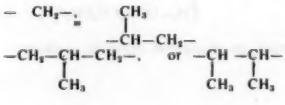


where R is hydrocarbon, amino, amide, ester, oxygen, silicon, ketone, phosphorus, sulfur, sulfone, or sulfoxide, A is alkyl, alkoxy, halo or nitro, and *n* is 1–4,

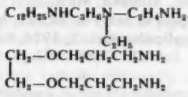
2. a polyfunctional amine selected from the group consisting of a polyamine of the formula



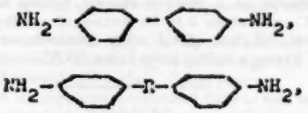
where A is



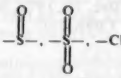
m being 2–10 and *n* being 1–8, $C_8H_{17}NH\text{-}CH_2CH_2NH_2$, $C_{14}H_{29}NH\text{-}CH_2CH_2NH_2$, $C_{16}H_{33}NHCH_2CH_2NH_2$, $C_{12}H_{25}NHC_2H_4NHC_2H_4NHC_2H_4NH_2$, $C_{12}H_{21}NHC_4H_8NH_2$,



p-phenylene diamine, m-phenylene diamine, o-phenylene diamine,



where R is O, S,

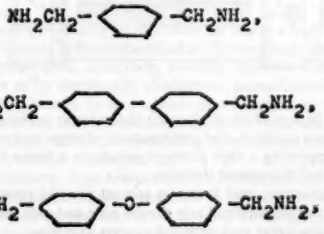


x being 1-4,

R′ being H or alkyl,

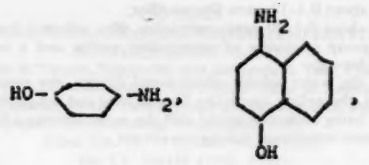
or

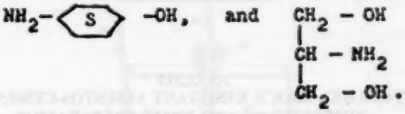
R″ being alkyl,



and morpholine, and

3. a polyfunctional alcohol-amine selected from the group consisting of $NH_2(CH_2)_xOH$, where *x* is 1–10,





3,933,513

REFRACTORY HEAT INSULATING MATERIALS

Vincent Edward Mellows, Birmingham, England, assignor to Foseco Trading A.G., Chur, Switzerland

Filed Oct. 2, 1973, Ser. No. 402,780

Claims priority, application United Kingdom, Oct. 19, 1972, 48248/72

Int. Cl.² C04B *35/80*

U.S. Cl. 106—65 **6 Claims**

1. A refractory heat insulating slab formed of a composition comprising by weight:

84–35% of a heavy refractory filler,

6–35% of a refractory fibrous material selected from the class consisting of mineral wool, slag wool, rock wool and glass fiber,

0.5–10% of a high swelling clay,

1–10% of a binding agent selected from the class consisting of urea formaldehyde resins and phenol formaldehyde resins,

0.01–2% of a flocculating agent for the clay and

0–10% of lightweight refractory filler, the slab being at least substantially free of cellulosic fiber.

3,933,514

HIGH STRENGTH, WATER RESISTANT SILICATE FOAM

William P. Banks; Jon R. Carlson, and Donald E. Becker, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 30, 1973, Ser. No. 356,027

Int. Cl.² C04B *35/16*

U.S. Cl. 106—75 **1 Claim**

1. A composition for producing a fire-resistant, high strength, low shrinkage silicate foam having high water resistance being an aqueous silicate dispersion mixed with about 45–60 parts water on the basis of 100 parts by weight of foam comprising the following ingredients mixed with said water;

a. about 25–36 parts water soluble alkali metal silicate;

b. about 8–20 parts cementing agent selected from the group consisting of sodium silicofluoride, zinc carbonate, magnesium carbonate, aluminum phosphate, zinc acetate and a mixture thereof;

c. about 0.2–6 parts gelling agent selected from the group consisting of low molecular weight amide and a mixture of amide and haloalcohol;

d. about 0.1–10 parts fibrous filler;
e. about 0.1–20 parts particulate filler selected from the group consisting of vermiculite, perlite and a mixture thereof;

with the water soluble alkali metal silicate, the cementing agent, the gelling agent, the fibrous filler and the particulate filler being uniformly mixed with the water forming a foamed aqueous suspension in aqueous silicate.

3,933,515

THERMAL SHOCK RESISTANT ASBESTOS-CEMENT COMPOSITIONS AND THEIR PREPARATION

Julie Chi-Sun Yang, Somerset, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 289,035, Sept. 14, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 503,906
Int. Cl.² C04B 7/02
U.S. Cl. 106—99 8 Claims

1. A thermal shock resistant asbestos-cement composition consisting essentially of the following ingredients, in percentage by weight on a dry solids basis:

a. 10 to 50% asbestos fibers;
b. silica in a percentage in the range of 20 to 40% less the percentage of the organic porosity-enhancing additive of (d) below;
c. 25 to 65% hydraulic cement; and
d. 1 to 30% of an organic fibrous porosity-enhancing additive selected from the group consisting of nylon fibers, orlon fibers and sisal fibers, said additive being of the type which will prevent surface cracking of a product made of said composition when said product is saturated with water and then subjected to temperatures on the order of 700°C for a period of one hour.

3,933,516

PHOTOGRAPHIC ELEMENT OF IMPROVED ANTISTATIC AND SLIPPAGE PROPERTIES CONTAINING CALCIUM STEARATE DISPERSION AND STEARAMIDO-PROPYL DIMETHYL-BETA-HYDROXY-ETHYL AMMONIUM NITRATE; GELATINOUS COMPOSITION, AND METHOD, FOR PREPARING SAID ELEMENT

E. Scudder Mackey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,140
Int. Cl.² C08L 89/00; G03C 1/78
U.S. Cl. 106—131 15 Claims

1. A gelatin-containing composition for a photographic film, comprising (a) about 1% to about 2.5% by weight, based upon the total gelatin solids content of said composition, of an aqueous dispersion of a salt of a metal selected from the group consisting of Li, Na, K, Mg, Ca, Ba, Sr, and Al and of a C_{12}–C_{32} organic fatty acid wherein the average particle size of the solids suspended in said dispersion is about 1 micron and the specific viscosity of said dispersion is about 350 cps to about 750 cps; and (b) about 2.5 to about 5% by weight, based upon the total gelatin solids content of said composition, of a quaternary ammonium compound of the formula:

$$RCONH(CH_2)_3N^+R_1R_2R_3.NO_3^-$$

wherein R is C_7–C_{17} alkyl, R_1 is hydroxyalkyl having from 1 to 6 carbon atoms, and R_2 and R_3 are each C_1–C_6 alkyl.

3,933,517

COMPOSITIONS FOR REFLOWING ORGANIC SURFACES

Thomas A. Vivian, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 34,527, May 4, 1970, abandoned. This application Oct. 7, 1974, Ser. No. 512,784
Int. Cl.² C08K 5/02
U.S. Cl. 106—311 8 Claims

1. A composition suitable for use as a superheated vapor for vapor reflowing plastic surfaces consisting essentially of about 50 to 99 percent of methylene chloride, 0 to 49 percent of one or more 1,2-dichloroethane, 1,1,1- and 1,1,2-trichloroethane, 1,2-cis- and trans-dichloroethene, trichloroethene, tetrachloroethene or a mixture thereof boiling below about 200° C., and about 1 to 20 percent of an alkylene glycol alkanoate, alkylene glycol ether alkanoate or a mixture thereof having a boiling point below 200°C.

3,933,518

COMPOSITIONS FOR REFLOWING ORGANIC SURFACES

Thomas A. Vivian, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 34,527, May 4, 1970, abandoned. This application Dec. 19, 1974, Ser. No. 534,243
Int. Cl.² C08K 5/02
U.S. Cl. 106—311 4 Claims

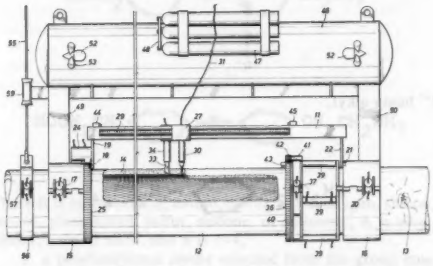
1. A vapor reflow composition consisting essentially of about 80 to 99 percent of chlorinated aliphatic hydrocarbon boiling below about 200°C., and about 1 to 20 percent of an alkylene glycol alkanoate, alkylene glycol ether alkanoate or mixture thereof having a boiling point below about 200°C. and a stabilizing amount of propylene oxide, butylene oxide, dimethoxymethane, nitromethane or mixtures thereof.

3,933,519

SUB-SEA PIPE CLEANING APPARATUS AND METHOD

George C. Koch; Paul M. Collins, and William E. White, Jr., all of Houston, Tex., assignors to HydroTech International, Inc., Houston, Tex.

Filed Apr. 25, 1974, Ser. No. 464,037
Int. Cl.² F16L 55/18; B08B 3/02; F16L 55/18
U.S. Cl. 134—34 15 Claims



1. In a method of cleaning the exterior surface of pipe in a sub-sea location, the combination of steps comprising:

supporting a high pressure nozzle on a frame for longitudinal movement thereon;
supporting said frame in spaced parallel relationship with the longitudinal axis of said pipe and said nozzle with the discharge end directed against said pipe;
supplying high pressure fluid to said nozzle to thereby effect cleaning of said pipe;
moving said nozzle longitudinally along said frame while supplying said fluid to said nozzle to thereby clean in a generally longitudinal direction along said pipe surface;

and moving said frame and nozzle circumferentially of said pipe, to thereby clean said pipe.

6. In apparatus for cleaning the exterior surface of a pipe in fixed position, the combination comprising:

a longitudinal frame;

means rigidly attachable to said pipe for supporting said frame in spaced parallel alignment with the longitudinal axis of said pipe;

means disposable radially outwardly of said exterior pipe surface for selectively rotating said frame about the entire circumference of said pipe while the said pipe remains in said fixed position;

a carriage mounted on said frame for longitudinal traverse therealong;

means for driving said carriage longitudinally along said frame;

a high pressure nozzle supported by said carriage for traverse therewith and having the discharge end thereof directed toward said surface of said pipe;

and means for supplying pressurized fluid to said nozzle to thereby direct a high pressure stream of fluid into contact with said surface of said pipe to clean said pipe.

3,933,520

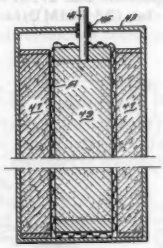
METHOD OF PREPARING ELECTRODES WITH POROUS CURRENT COLLECTOR STRUCTURES AND SOLID REACTANTS FOR SECONDARY ELECTROCHEMICAL CELLS

Eddie C. Gay, Park Forest, and Fredric J. Martino, Riverdale, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 3, 1975, Ser. No. 565,021

Int. Cl.² H01M *35/00, 43/00*

U.S. Cl. 136—6 LF **16 Claims**



1. A method of preparing an electrode for use in a high-temperature, secondary, electrochemical cell comprising distributing solid, particulate, electrode, reactant material over an upper surface of an electrically conductive, porous substrate; vibrating said substrate to impregnate said reactant material into a portion of the void volume of said porous substrate; and filling substantially all of the remaining void volume of said substrate with molten electolytic salt.

8. In a secondary, high-temperature, electrochemical cell including an alkali metal alloy reactant in the negative electrode, a metal sulfide reactant in the positive electrode, and a molten electrolyte containing ions of said alkali metal, the improvement wherein at least one of said electrodes comprises an integral, porous substrate of electrically conductive material impregnable by said molten electrolyte and having solid particles of reactant distributed throughout the void volume of said substrate.

3,933,521

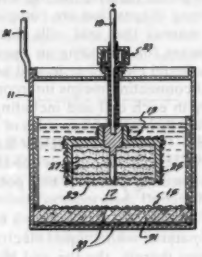
ANODE FOR A SECONDARY, HIGH-TEMPERATURE ELECTROCHEMICAL CELL

Donald R. Vissers, Naperville, and Benjamin S. Tani, Chicago, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 13, 1975, Ser. No. 549,635

Int. Cl.² H01M *43/00, 35/00*

U.S. Cl. 136—6 LF **10 Claims**



1. In a secondary electrochemical cell comprising an anode containing lithium metal, a cathode containing a chalcogen material and an electrolytic salt between said anode and cathode, the improvement wherein said anode comprises a porous base structure with open interstitial crevices, cobalt coating on surfaces of said interstitial crevices and said lithium metal impregnated into said interstitial crevices in contact with said cobalt coating.

8. A method of preparing an anode for use within an electrochemical cell including said anode, a cathode and an electrolytic salt, said method comprising cleaning a mass of metallic wool comprising entangled metallic fibers, depositing a cobalt metal coating onto said metallic fibers, compacting said metallic wool to form a porous substrate, and sorbing molten lithium metal onto said porous substrate.

3,933,522

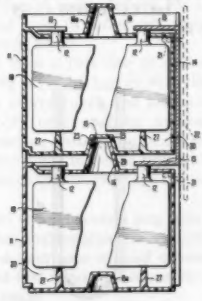
ACCUMULATOR CELL

Hans Steig, Soest, Germany, assignor to Accumulatorenfabriken Wilhelm Hagen AG, Germany

Filed June 4, 1974, Ser. No. 476,322

Int. Cl.² H01M *10/00*

U.S. Cl. 136—6 R **27 Claims**



1. A storage battery comprising a plurality of cells supported one upon another, each cell including a cuboid housing of non-conducting material with a liquid electrolyte and positive and negative plate elements therein, the top and bottom sides of said housings having shapes that are complementary

to each other in such a way that said cells stack compactly one upon another, means for providing an open communication path between the liquid electrolyte in said housings of adjoining cells, and electrically conducting means including positive and negative terminal conductors extending through said housings in liquid-sealing relation thereto and electrical conductors outside the housings of said cells interconnecting plate elements of like polarity of adjoining cells.

20. A storage battery comprising a plurality of cells supported one upon another, each cell including a cuboid housing of non-conducting material with a liquid electrolyte and positive and negative plates therein, the top and bottom sides of said housings having shapes that are complementary to each other in such a manner that said cells stack compactly one upon another, means for providing an open communication path between the liquid electrolyte in said housings of adjoining cells terminal connecting means interconnecting plates of the same polarity in each cell and including cylindrical lead members extending through the top sides of said housings and sealed fluid-tightly therein by injected lead bushings, and means including electrical conductors outside the housings of said cells interconnecting plates of like polarity of adjoining cells.

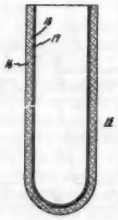
25. A storage battery cell comprising a cuboid housing of non-conducting material with a liquid electrolyte and positive and negative plates therein, the top and bottom sides of the housing having shapes that are complementary to each other in such manner that the cell may be stacked compactly upon or under another cell of similar construction means in said housing providing open communication between the liquid electrolyte therein and the liquid electrolyte in the housing of an adjoining cell of similar construction, terminal means interconnecting plates of like polarity in said cell and including cylindrical lead members extending through the top side of said housing and sealed therein by injected lead bushings, a member on the top said of said housing, outside the dividing line between the material of said top side of said housing and said lead bushings, provided with internally threaded portions concentric with and radially spaced from said cylindrical lead members, and annular means threaded into said internally threaded portions for exerting sealing pressure at said dividing line.

3,933,523

SOLID SODIUM ION-CONDUCTIVE ELECTROLYTE WITH LIQUID METALLIC LAYER

Robert R. Dubin, Schenectady; Fritz G. Will, Scotia, and William L. Mowrey, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 451,965, March 18, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,556
Int. Cl.² H01M *43/06*
U.S. Cl. 136—6 FS **7 Claims**



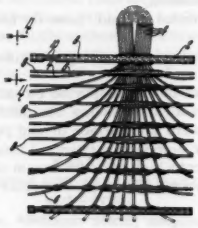
1. A composite article consisting of a solid sodium ion-conductive electrolyte, and a liquid mercury-indium alloy layer adhering intimately to one major surface of the electrolyte.

3,933,524

ANTIMONY PLATING OF LEAD-ACID STORAGE BATTERIES GRIDS

Thomas J. Hughel, Royal Oak, and Richard H. Hammar, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 256,508, May 24, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,066
Int. Cl.² H01M *35/08*
U.S. Cl. 136—64 **2 Claims**



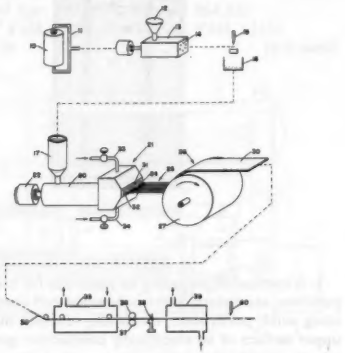
1. A grid for a Faure-type lead-acid storage battery positive plate comprising a substantially nonantimonial lead alloy substructure having an antimony deposit on its surface, said deposit density being at least about 0.0002 grams per square centimeter but less than about 0.00132 grams per square centimeter of said surface.

3,933,525

BATTERY SEPARATOR MANUFACTURING PROCESS

Nigel Innes Palmer, Lexington, and Nathan Sugarman, Needham Heights, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 317,487, Dec. 21, 1972, Pat. No. 3,870,567. This application Dec. 27, 1974, Ser. No. 537,052
Int. Cl.² H01M *2/14*
U.S. Cl. 136—146 **1 Claim**



1. A battery with a positive plate, a negative plate and a separator of polymeric resin having a degree of undesirable hydrophobia, solid below 180°F, extrudable as a hot melt and resistant to degradation by at least either acids or alkalies positioned between said plates, said separator comprising a nonwoven mat of fibers, said fibers comprised of said polymeric resin and a wetting agent in an amount of 0.5–20 percent by weight based on the weight of the resin with said amount (a) being incompatible with the resin below the resin's melting point such that the wetting agent will bloom over a period of time at ambient temperatures in a battery yet (b)

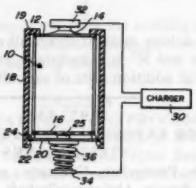
being compatible with the resin at the extrusion temperature and (c) bringing about blooming to the surface of said fibers when said fibers are subjected to heat and pressure.

3,933,526

HOUSING FOR BATTERY CELL WITH PROTECTION FOR PRESSURE AND TEMPERATURE

Mark H. Rackin, Sunrise, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,210
Int. Cl.² H01M 6/50
U.S. Cl. 136—166 **6 Claims**



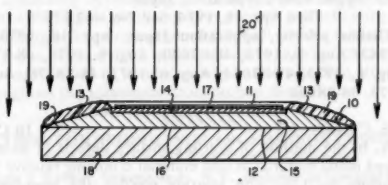
1. A housing for a rechargeable battery cell having first and second electrodes, including in combination:
   a tubular member having first and second ends;
   a closure for said first end having a first conducting contact thereon connected to a first electrode of the battery;
   a conducting inner closure for said second end connected to the second electrode of the battery; and
   a conducting outer closure for said second end having a second conducting contact thereon, said outer closure being movable from a first normal position in which said outer closure makes electrical connection with said inner closure to a second position in which said outer closure is spaced from said inner closure, said outer closure being responsive to a rise in temperature in the battery cell to move to said second position to open the circuit from said first and second conducting contacts to the electrodes of the battery.

3,933,527

FINE TUNING POWER DIODES WITH IRRADIATION

Krishan S. Tarneja; John Bartko, and Joseph E. Johnson, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 9, 1973, Ser. No. 339,699
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01L 21/263
U.S. Cl. 148—1.5 **4 Claims**



1. A method of fine tuning a diode of a type of diodes comprising the steps of:
   A. determining the minority carrier radiation damage factor for the type of diode with a given electron radiation source of intensity between about 1 and 3 Mev;
   B. measuring the nominal minority carrier lifetime in the anode region of the type of diode;
   C. establishing the nominal minority carrier lifetime desired in the anode region of the type of diode;
   D. thereafter determining the radiation dosage from the given electron radiation source to obtain the desired nominal minority carrier lifetime by the relationship $1/\tau = 1/\tau_o + K\phi$

where

τ is the established nominal minority carrier lifetime,
τ_o is the measured nominal minority carrier lifetime,
K is the minority carrier radiation damage factor, and
ϕ is the electron radiation dosage; and

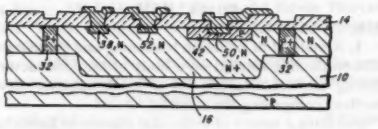
   E. irradiating a major surface of at least one diode of the type of diodes with the given radiation source to the determined radiation dosage.

3,933,528

PROCESS FOR FABRICATING INTEGRATED CIRCUITS UTILIZING ION IMPLANTATION

Benjamin Johnston Sloan, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 2, 1974, Ser. No. 485,199
Int. Cl.² H01L 21/265
U.S. Cl. 148—1.5 **10 Claims**



1. A method of fabricating a semiconductor device having a semiconductor substrate with a surface of one conductivity type on which is disposed an insulating layer, including the steps of
   a. forming a patterned layer on said insulating surface, said patterned layer having defined therein a plurality of critically spaced apertures;
   b. removing at least a portion of the thickness of said insulating layer in areas defined by said apertures in said patterned layer to define self-aligned control areas in said insulating layer;
   c. covering at least a first one of said control areas in said insulating layer by barrier material to prevent ion implantation therethrough and implanting dopant ions of conductivity type opposite to that of said semiconductor surface through at least second and third of said control areas to define first and second regions of said opposite conductivity type in said semiconductor surface;
   d. covering said second control area with barrier material to prevent ion implantation therethrough and implanting further dopant ions of said opposite conductivity type into said first region to reduce the sheet resistivity of said first region;
   e. introducing impurities of said one conductivity type into a reduced area of said first region to form therein a third region of said one conductivity type, and through a third one of said control areas into a further area of said semiconductor surface to form a fourth region of said one conductivity type.

3,933,529

PROCESS FOR THE PRODUCTION OF A PAIR OF COMPLEMENTARY FIELD EFFECT TRANSISTORS

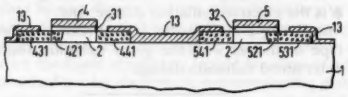
Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 10, 1974, Ser. No. 487,153

Claims priority, application Germany, July 11, 1973, 2335333

Int. Cl.² H01L 21/265

U.S. Cl. 148—1.5 6 Claims



6. A process as claimed in claim 5, in which the metal layers which serve as a protection from implantation consist of aluminum.

3,933,530

METHOD OF RADIATION HARDENING AND GETTERING SEMICONDUCTOR DEVICES

Charles William Mueller, Princeton; Edward Curtis Douglas, Princeton Junction, and Chung Pao Wu, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 28, 1975, Ser. No. 544,702

Int. Cl.² H01L 21/265

U.S. Cl. 148—1.5 7 Claims

1. A method of radiation hardening and gettering a layer of silicon dioxide formed on a body of semiconductor material during the manufacture of a semiconductor device, said method comprising the steps of:

providing a source of molecular aluminum halide ions, and

accelerating said molecular aluminum halide ions towards said body, on an impact course, with a kinetic energy that is greater than the molecular binding energy of said molecular aluminum halide ions so that each of said molecular aluminum halide ions breaks up into Al ions and halide ions upon impact, whereby each of said Al ions and halide ions assumes an ion-implantation energy substantially proportional to the ratio of its mass to the mass of said molecular aluminum halide ions.

3,933,531

METHOD OF RUST-PREVENTING FOR COPPER AND COPPER ALLOY

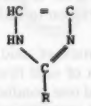
Natsuo Sawa, 651 Horie, Tadotsu-cho, and Masahiro Hoda, 321-3 Minamikamo, Tadotsu-cho, both of Nakatado, Kagawa, Japan

Continuation-in-part of Ser. No. 243,048, April 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 3,482, Jan. 16, 1970, abandoned. This application June 24, 1974, Ser. No. 482,165

Int. Cl.² C23F 11/00

U.S. Cl. 148—6.14 R 21 Claims

1. A method for preventing discoloration of copper or copper alloy, subsequently exposed to a gaseous atmosphere containing sulfur compounds, which method comprises surface-treating the copper or copper alloy with at least one compound selected from the group consisting of alkylimidazoles represented by the general formula:



wherein R is a long straight chain alkyl group having 5–21 carbon atoms and R′ is a hydrogen atom or a lower alkyl group, and acid addition salts of said alkylimidazoles thereby to coat said surface with micelles of said alkylimidazoles which act to prevent discoloration of said copper or copper alloy.

16. Copper or copper alloy which is resistant to discoloration when exposed to a gaseous atmosphere containing sulfur compounds and whose surface has been treated with at least one compound selected from the group consisting of alkylimidazoles represented by the general formula

wherein R is a long straight chain alkyl group having 5–21 carbon atoms and R′ is a hydrogen atom or a lower alkyl group, and acid addition salts of said alkylimidazoles.

3,933,532

METHOD FOR EXPOSING SURFACE DEFECTS ON HOT STEEL BLANKS

Klaus Glomb, Pumpchen, Germany, assignor to Eschweiler Bergwerks-Verein Aktiengesellschaft, Kohlscheid, Aachen, Germany

Continuation-in-part of Ser. No. 393,712, Sept. 4, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,671

Claims priority, application Germany, Sept. 20, 1972, 2246157

Int. Cl.² C21D 1/82; C23F 7/04

U.S. Cl. 148—6.35 5 Claims

1. A method for exposing surface defects on steel blanks having a given hot working temperature, comprising the following steps:

a. employing blanks heated to a temperature within the range of about 500° to 1100°C whereby such temperature is kept below said given hot working temperature of the particular steel blank,

b. rapidly descaling the heated blank by exposing the heated blank to cold water under pressure within the range of about 100 atm to 500 atm (gauge) thereby limiting the exposing to a duration of about 1.10^{-4} seconds to 3.10^{-2} seconds so that any substantial chilling of the blank is avoided, and

c. controlling the cooling of the thus descaled blank with a cooling rate within the range of about 10°C/minute to about 100°C/minute, to thereby produce an oxidation film on the descaled surface which oxidation film makes said surface defects visible.

3,933,533

METHOD AND APPARATUS FOR INITIATING SCARFING

Youtaro Uchida; Goro Miya; Kazuo Kobayashi; Masayuki Oguni; Tomokazu Yoshimura; Naoteru Yonemori, all of Tokai, and Teruo Kameyama, Gifu, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Apr. 18, 1974, Ser. No. 462,175

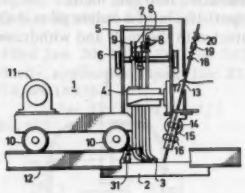
Claims priority, application Japan, Apr. 18, 1973, 48-43943; Aug. 6, 1973, 48-87630; Aug. 6, 1973, 48-87631; Aug. 6, 1973, 48-87634; Aug. 6, 1973, 48-88178; Aug. 6, 1973, 48-88180

Int. Cl.² B23K 7/06, 7/08

U.S. Cl. 148—9.5 10 Claims

1. In the method of scarfing surface defects of to-be-surfaced metal material as said material is moving relative to the scarfing machine with scarfing nozzles, the improvement, which comprises a step of supplying oxygen into a consumable electrode pipe so provided as to be directed to a scarfing point detected on the surface of said to-be-scarfed metal material for jetting the oxygen from the tip of said electrode pipe; a step of lowering said electrode pipe until its tip contacts said metal material; a step of heating rapidly the contacting portion, respectively, of said electrode pipe and of said metal

material with electrical energy and heat of oxidation so that the temperature of such portion may rise to the scarfing start



temperatue; and a step of initiating the scarfing process instantaneously from such temperature rising portion with the oxygen jetted from said scarfing nozzles.

3,933,534

CONTINUOUS HEAT TREATING PROCESS FOR LOW CARBON STRUCTURAL STEELS IN BAR FORM

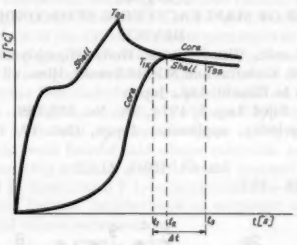
Ludwig Ettenreich, Vienna, Austria; Otto Reimann, Dusseldorf-Oberkassel, and Klaus Greulich, Erkrath, uber Dusseldorf, both of Germany, assignors to Bau-Stahlgewebe GmbH, Dusseldorf-Oberkassel, Germany

Filed May 11, 1972, Ser. No. 252,690

Claims priority, application Germany, May 13, 1971, 2123687. The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.² C21D *1/18*

U.S. Cl. 148—12 B **20 Claims**



1. In a process for preparing a structural steel in which the steel is rapidly heated and thereafter quenched, said steel having a maximum carbon content of 0.26 weight percent, the balance comprising iron, the improvement which comprises heating said steel only in its shell to a temperature between its incipient pearlite transformation and 1300°C such that its core heats up at an average rate of at least 100°C/sec. to a temperature between the incipient pearlite transformation and 900°C and commencing quenching in less than 5 seconds from passing the incipient pearlite transformation point, and performing the quenching operation prior to the attainment of equilibrium with respect to the carbon content and effecting said quenching prior to reduction of the shell surface temperature to a value below 650°C, so that the more carbon rich portions are transformed to a substantially martensite free structure throughout the transverse cross-section thereof.

3,933,535

METHOD FOR PRODUCING LARGE AND/OR COMPLEX PERMANENT MAGNET STRUCTURES

Joseph J. Becker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 437,311, Jan. 28, 1974, abandoned. This application May 12, 1975, Ser. No. 576,597

Int. Cl.² H01F *1/02*

U.S. Cl. 148—103 **4 Claims**

1. A method of producing a large and/or complex magnetized permanent magnet structure having a surface area greater than 4 square inches with predetermined magnetic properties and geometry and having a flux determined by its shape and consisting essentially of premagnetized modules comprising forming a powder consisting essentially of a permanent magnet type cobalt-rare earth alloy having an average particle size up to about 10 microns, subjecting said powder to a magnetic field to magnetically align it along its easy axis of magnetization, pressing the aligned powder into a compact having a density of at least 70%, coating said compact with a non-magnetic protective coating selected from the group consisting of a plastic or metal, and magnetizing said coated compact along its easy axis of magnetization producing a premagnetized module, said premagnetized module being characterized by an intrinsic coercive force H_{ci} at least 30% higher than its ordinary coercive force H_c, a demagnetization curve substantially in the form of a straight line and a recoil line substantially identical to its demagnetization curve when its remanent flux is driven to zero, producing a plurality of said premagnetized modules of substantially the same size and having substantially the same properties, and bonding together a plurality of said premagnetized modules to produce said magnetized permanent magnet structure, said premagnetized modules being bonded so that only north poles of bonded modules form the surface of the north pole of said magnetized permanent magnet structure and only south poles of bonded modules form the surface of the south pole of said magnetized permanent magnet structure, said bonding always including external physical means.

3,933,536

METHOD OF MAKING MAGNETS BY POLYMER-COATING MAGNETIC POWDER

Manfred Doser, Edmore, Mich., and Daniel Edwin Floryan, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,424. The portion of the term of this patent subsequent to Dec. 20, 1991, has been disclaimed.

Int. Cl.² H01F *1/02*

U.S. Cl. 148—105 **5 Claims**

1. The method of making a permanent magnet which comprises:

dissolving in a solvent an organic polymer which is a binder for magnetic particles;

adding particles of magnetic powder to the resulting solution;

adding to said solution a vehicle in which said polymer is insoluble until the polymer precipitates onto the particles; and

hot pressing the polymer-coated particles into a compact to form a magnet.

3,933,537

METHOD FOR PRODUCING ELECTRICAL STEEL SHEETS HAVING A VERY HIGH MAGNETIC INDUCTION

Takuichi Imanaka, and Takahiro Kan, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Nov. 23, 1973, Ser. No. 418,671

Claims priority, application Japan, Nov. 28, 1972, 47-118524

Int. Cl.² H01F *1/04*

U.S. Cl. 148—112 **1 Claim**

1. In a method for producing electrical steel sheets having a very high magnetic induction in which an electrical steel raw material is hot rolled, annealed at a temperature of 750°–1200°C the sheet is subjected to at least one cold rolling including, at least a final cold rolling, at a reduction rate of 40–89% to produce a steel sheet having a final gage of 2–4mm, with said 750°–1200°C annealing occurring before said final cold rolling, said cold rolled sheet being subjected to a decarburizing annealing and a final annealing to develop the secondary cyrstallized grain of (110) [001]; the improvement comprising utilizing an electrical steel raw material consisting of less than 4.5% Si, less than 0.06% C, 0.025–0.035% of Sb, 0.01–0.035% of soluble Al, 0.02–0.20% of Mn with the re-

mainder of the composition comprising iron and incidental impurities and the improvement further comprising subjecting the sheet to a final annealing at a temperature of 800°–950°C for from 5 to 120 hours to develop the secondary recrystallized grains of (110) [001] orientation and then subjecting said sheet to a subsequent purifying annealing at a temperature higher than 1000°C to remove the impurities.

3,933,538

METHOD AND APPARATUS FOR PRODUCTION OF LIQUID PHASE EPITAXIAL LAYERS OF SEMICONDUCTORS

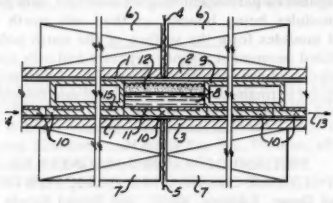
Shin-ichi Akai; Hideki Mori; Nobuo Takahashi, and Shin-ichi Iguchi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 10, 1973, Ser. No. 322,522

Claims priority, application Japan, Jan. 18, 1972, 47-7040; Jan. 19, 1972, 47-7828; Jan. 19, 1972, 47-7829; Jan. 28, 1972, 47-10645

Int. Cl.² H01L *7/38*

U.S. Cl. 148—171 **13 Claims**



1. A method for successively growing single crystal epitaxial layers of semiconductors which have the ternary or more multi-component homogeneous composition and/or uniform doping level in the binary or more multi-component semiconductors on suitable substrates from the liquid phase comprising the steps of:

applying heat to a molten metallic solvent solution of a source material of said semiconductor and thereby establishing a temperature gradient therein with a high temperature region and a low temperature region;

contacting a solid source material with the high temperature region of said solution and thereby dissolving said source material into said high temperature region of said solution with at least a portion of said solid source material always at an undissolved state;

contacting at least one substrate surface with the low temperature region of said solution and thereby growing the epitaxial layers on the substrates by diffusion of the dissolved source material through said solution and supersaturation of said material in the low temperature region;

maintaining the temperatures in said solution constant during said epitaxial growth;

controlling the composition and/or doping level of said epitaxial layers by selecting substantially equal composition and/or doping level of the undissolved solid source material to said semiconductor to be grown;

removing said treated substrate from contact with said solution after a predetermined time and contacting at least one more substrate surface with said same solution for successive growth of epitaxial layers on a plurality of different substrate portions.

3,933,539

SOLUTION GROWTH SYSTEM FOR THE PREPARATION OF SEMICONDUCTOR MATERIALS

William W. Gartman, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,861

Int. Cl.² H01L *7/38*

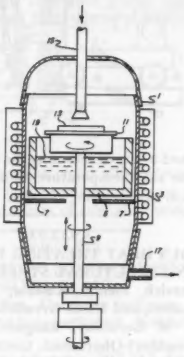
U.S. Cl. 148—171 **24 Claims**

1. A method of solution growth of a Group III–V semiconductor material onto a substrate comprising the steps of

a. providing a melt comprising a saturated solution of a Group III–V semiconductor compound in a Group III solvent for said compound,

b. lowering a substrate into said melt,

c. passing a vapor stream of a halide of said Group V element in contact with the melt and withdrawing a predetermined amount of said solvent from said melt as Group III halide vapor to cause deposition of said compound onto said substrate; and



d. maintaining a uniform, constant temperature throughout the melt during the complete deposition period.

3,933,540

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

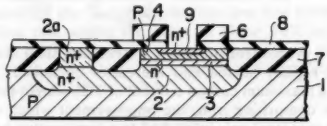
Hiroyuki Kondo, Hinode; Atsuo Hotta, Higashiyamato; Akio Hayasaka, Kodaira, and Michio Suzuki, Hino, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 8, 1974, Ser. No. 495,789

Claims priority, application Japan, Oct. 17, 1973, 48-115821

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 **10 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

a. forming a first semiconductor region of a first conductivity type into a first surface portion of a semiconductor substrate of a second conductivity type, opposite said first conductivity type;

b. forming a first semiconductor layer having said first conductivity type on said substrate and said first region formed therein;

c. introducing a first impurity of said second conductivity type to a prescribed depth into the surface of said first semiconductor layer, thereby forming a second semiconductor region of said second conductivity type in said first semiconductor layer;

d. selectively oxidizing prescribed portions of said first semiconductor layer down through said layer and reaching said substrate and said first semiconductor region, thereby forming an oxide film for isolating elements from one another; and

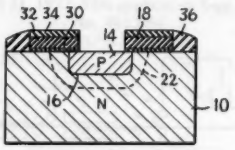
e. introducing a second impurity of said first conductivity type into a selected surface portion of said second semiconductor region.

3,933,541

PROCESS OF PRODUCING SEMICONDUCTOR PLANAR DEVICE

Hiroyasu Hagino; Yasuya Kajiwara, and Seiichi Nagai, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 20, 1975, Ser. No. 542,251
Claims priority, application Japan, Jan. 22, 1974, 49-9868; Feb. 16, 1974, 49-18936
Int. Cl.² H01L 21/322
U.S. Cl. 148—187 8 Claims



1. A process of producing a semiconductor planar device comprising the steps of immersing a main face of an N type silicon substrate into a selected one of aqueous hydrogen peroxide and a mixture of aqueous hydrogen peroxide and a chemical compound including an amino radical, successively depositing a silicon dioxide film and a silicon nitride film on the main face of the silicon substrate processed in the preceding step through the chemical vapor deposition, selectively removing those portions of said silicon dioxide film and said silicon nitride film underlaid by a predetermined area of said main face of said silicon substrate where a P type semiconductor region is formed thereby to expose said predetermined area of said main face of said silicon substrate, and diffusing a P type impurity into said predetermined exposed area of said main face to form a said P type semiconductor region with a PN junction formed therebetween to terminate at said main face of said silicon substrate.

3,933,542

ROCKET PROPELLANT WITH ACRYLATE BINDER AND DIFLUOROAMINO PLASTICIZER

Lewis B. Childs, Jr., Vienna, and James D. Martin, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 16, 1972, Ser. No. 263,892
Int. Cl.² C06D 5/06
U.S. Cl. 149—19.3 14 Claims

1. A solid rocket propellant comprising (1) about 25–55 weight percent of a binder which comprises (a) about 2–25 weight percent of a polymer which comprises about one to about 20 weight percent acrylic acid with the remainder comprising a lower alkyl acrylate and (b) about 75–98 weight percent of an energetic difluoroamino group containing plasticizer, selected from the group consisting of 1,2,3-tris[α,β-bis (difluoroamino) ethoxy] propane, hexakis (difluoroamino) propylether, 1,2-di[2,2,3-tris(difluoroamino) propoxy]-1,2-bis(difluoroamino)ethane, 1,2,4,5-tetrakis(difluoroamino)amyl methacrylate and mixtures thereof, (2) about 0–15 weight percent of a fuel selected from the group consisting of aluminum, boron and mixtures thereof, (3) about 45–75 weight percent of an oxidizer, and (4) about ½–5 weight percent curing agent, provided that the amount of oxidizer present be sufficient to provide for complete oxidation of said binder and said fuel.

3,933,543

PROPELLANT COMPOSITIONS CONTAINING A STAPLE METAL FUEL

Dale A. Madden, Fairfax County, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Jan. 15, 1964, Ser. No. 337,955
Int. Cl. C06b 15/00
U.S. Cl. 149—21 20 Claims

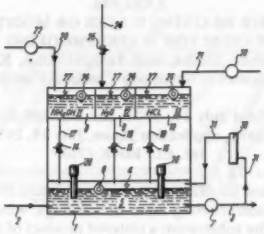
1. In a propellant composition comprising an oxidizing component selected from the group consisting of inorganic perchlorates or nitrates, metal peroxides, hydrazine nitroformate, and mixtures thereof, a non-metal fuel component selected from the group consisting of inert fuels and fuels rendered active by molecularly combined nitroso, nitro, nitrite or nitrate groups, and mixtures thereof and a metal fuel component, the improvement in which the metal is selected from the group consisting of aluminum, beryllium, zirconium, magnesium, titanium, tungsten, alloys thereof, and mixtures thereof, and is in the form of staple having a maximum thickness of about 0.001 inch, a maximum ratio of thickness to width of about 1 to 4, a minimum length of about 0.03 inch and a maximum ratio of width to length of about 1 to 1.

3,933,544

METHOD OF ETCHING COPPER AND COPPER ALLOYS

Rainer Haas, Magstadt, Germany, assignor to Firma Hans Hollmuller, Maschinenbau, Herrenberg, Germany

Division of Ser. No. 230,871, March 1, 1972, Pat. No. 3,806,393. This application Aug. 6, 1973, Ser. No. 386,021
Claims priority, application Germany, Mar. 8, 1971, 2110950; Aug. 11, 1971, 2140215; Switzerland, Jan. 21, 1972, 1025/72
Int. Cl.² C23F 1/00
U.S. Cl. 156—19 3 Claims



1. A method of etching copper and copper alloys, comprising:

forming an etching medium consisting of an ammoniacal etching solution containing chloride ions, thereby producing a copper-I compound;

regenerating the copper-I compound formed during the etching process by reacting therewith a chloro compound selected from the group which consists of HCl, ammonium chloride and NaCl only during the etching process by the addition of the chloro compound to said solution at a rate corresponding to the rate of formation of said copper-I compound; and

supplying to said solution an amount of an ammoniacal compound selected from the group which consists of ammonium hydroxide and ammonia gas such that the pH-value of the latter is maintained at about 8.5 to 10.0, the copper content per liter of etching medium being maintained at a substantially constant value by the addition of water, the addition of the chloro compound to the etching medium to be regenerated being controlled in dependence upon the redox potential of the etching medium, while the molar ratio of the chloro compound to the ammoniacal compound amounts substantially to 1 to 2.

3,933,545
CONTROL OF LACE PRODUCTION

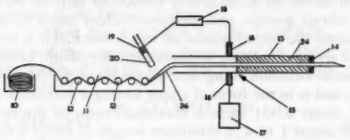
Kenneth Edward Wilkinson, Hertford, England; John Howard Davis, deceased, late of Hertford, England (by Barabara Davis, executrix), and by Richard C. Harwood, executor, Chalfont St. Giles, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 29, 1974, Ser. No. 474,425

Claims priority, application United Kingdom, June 6, 1973, 26983/73

Int. Cl.² G01B *7/26, 7/08*

U.S. Cl. 156—64 **6 Claims**



1. A process for the production of a lace by drawing a lace precursor which includes powdered thermoplastic polymer through a heated tube to melt the polymer and then through a die to consolidate the product into lace and remove excess polymer which accumulates as a melt pool in the tube, said process including the further steps of detecting the presence or absence of the melt pool at a suitable location in the tube and correspondingly adjusting the input of polymer to the lace precursor so that the amount of polymer is varied depending on whether molten polymer is present or absent at the chosen location whereby a lace of uniform composition is produced and wastage of polymer is minimized.

3,933,546
METHOD FOR DRAINING WATER OR MOISTURE FROM SUBSTRATUM FOR WATERPROOFING LAYER

Hidekiyo Gohda, Osaka, and Takashi Kiku, Kobe, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed July 19, 1974, Ser. No. 489,891

Claims priority, application Japan, July 25, 1973, 48-84352

Int. Cl.² E04F *17/00*

U.S. Cl. 156—71 **7 Claims**

1. A method for draining water or moisture from a substratum for a waterproofing layer in buildings, which comprises applying to the substratum a sintered product of a thermoplastic resin, having a capillary structure comprising numeral, fine and interconnecting pores and voids of 20 to 70 percent, selected from the group consisting of a sintered plate and a sintered hollow product in the form of a belt or tube, wherein at least a part of the sintered product is protruded into the atmosphere, and applying thereto a waterproofing layer, and thereby making the water or moisture contained in the substratum evaporate through the sintered product.

3,933,547
METHOD FOR FIXING A PATTERN DESCRIBED ON THE SURFACE OF THERMOPLASTIC RESIN ARTICLES

Masafumi Yoshida, and Akira Esaka, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,392

Claims priority, application Japan, Feb. 14, 1973, 48-17513

Int. Cl.² B32B *31/20, 31/26*

U.S. Cl. 156—77 **8 Claims**

5. A method for fixing a pattern described on a surface of thermoplastic resin sheet, which comprises stretching a thermoplastic resin composition sheet containing 30 to 90 percent by weight of finely divided inorganic filler based on the weight of resin composition sheet so as to form a fine interconnected open-cell structure in the stretched sheet; impressing a pattern with inks or colors on the surface of said stretched sheet; and heating under pressure the pattern bearing surface to a temperature above the melting point of said thermoplastic resin so as to cover the pattern-bearing surface with a thin film of resin formed from the original surface layer resin of the sheet.

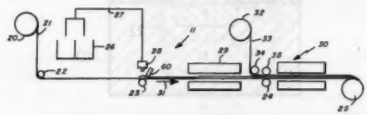
3,933,548
PRODUCTION OF URETHANE FOAMS AND LAMINATES THEREOF

Harry M. Anderson, Jr., Marblehead, and Charles K. Knisely, Boxford, both of Mass., assignors to Beatrice Foods Co., Peabody, Mass.

Filed Aug. 19, 1974, Ser. No. 498,584

Int. Cl.² B32B *5/20, 5/18*

U.S. Cl. 156—78 **11 Claims**



1. A method of forming a flexible polyurethane foam layer having uniform controlled film layer thickness,

said method comprising,

spreading a layer of a polyurethane reactants containing mixture over a carrier surface in a uniform layer thickness,

said polyurethane reactants consisting essentially of an isocyanate and a hydroxyl terminated polyol having from 1 to 9% by weight thereof of an inorganic carbon dioxide producing blowing agent incorporated therein,

and heating said layer to a temperature in the range of from 260°F to 390°F to cause release of carbon dioxide in said mixture and formation of polyurethane foam in a uniform thickness final product.

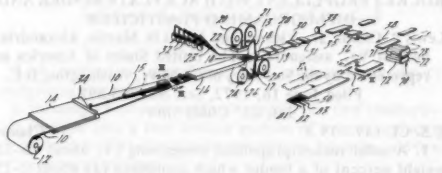
3,933,549
LAMINATED FLOOR MANUFACTURING METHOD

Fred G. Heimann, Mt. Clemens, and Richard Abbott, Dearborn, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.

Filed Mar. 15, 1974, Ser. No. 451,440

Int. Cl.² B32B *5/18*

U.S. Cl. 156—79 **3 Claims**



1. The method of manufacturing a laminated panel or the like which includes synchronously moving forwardly and securing together a pair of spaced parallel sheets of paneling material and an interposed core sheet having a transversely crenelated cross section which defines longitudinal channels, said forward movement being parallel to the longitudinal channels, severing the same transversely to form individual panels, closing the forward ends of the channels, moving each panel laterally to a position wherein each channel is in alignment with a foam-filling lance and then in a reverse longitudinal direction onto overfitting relation with respect to the lances, moving the panel and lances together laterally farther in the same lateral direction to a position of alignment with a delivery station, and then injecting a foaming agent through the lances into the hollow core while the panel is moving

longitudinally in the forward direction off of the lances to a delivery position.

3,933,550

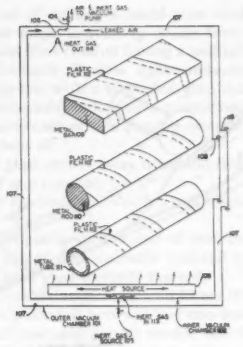
HEAT BONDING FLUOROCARBON AND OTHER PLASTIC FILMS TO METAL SURFACES

Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co., Houston, Tex.

Continuation-in-part of Ser. No. 311,137, Dec. 1, 1972, Pat. No. 3,841,937, which is a continuation of Ser. No. 41,375, May 28, 1970, abandoned, and a continuation-in-part of Ser. No. 246,220, April 21, 1972, Pat. No. 3,837,956, which is a division of Ser. No. 41,375, and a continuation-in-part of Ser. No. 371,346, June 19, 1973, which is a division of Ser. No. 246,220, April 21, 1972. This application Sept. 28, 1973, Ser. No. 401,656

Int. Cl.² B32B *15/08*

U.S. Cl. 156—85 **35 Claims**



1. The method of adhering a preformed continuous pliable film of heat bondable and porous fluorocarbon plastic polymeric material to a flat or convex metal surface which comprises heating both the metal surface and a layer of the plastic material superposed upon the metal surface in a gaseous environment of reduced pressure sufficiently to soften the plastic film and bond the same to the metal surface without rupturing the film employing multiple, successive steps of heating, bonding and cooling without application of compressive pressure to the outer surface of the heated plastic film to form a bonded metal-plastic combination without entrapment of gas.

3,933,551

STABILIZATION OF TREAD STRIP DURING BONDING TO TIRE

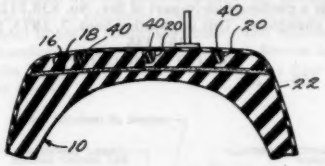
Edwin T. Brodie, and Ronald Seiler, both of Muscatine, Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Filed Nov. 30, 1973, Ser. No. 420,577

Int. Cl.² B29H *5/04, 17/36*

U.S. Cl. 156—96 **4 Claims**

1. In the method of bonding the circumference of a tire casing to a prevulcanized rubber tread strip having a continuous undertread portion integral with tread ribs which are spaced apart by grooves by interposing a cold-vulcanizable bonding medium between the tread strip and the tire casing, engaging the outer surface of the tread ribs with a pressing element which is essentially free of engagement with the surfaces of the grooves and forcing the pressing element simultaneously against the entire outermost surface of the tread ribs in order to press the tread strip against the tire casing and to expel entrapped air from between the tread strip and the tire casing, while heating the bonding medium to effect vulcanization thereof, the improvement which comprises placing in at least one of the tread grooves a temporary pressure-transmitting support member which engages the bottom and at least a substantial portion of the side wall of the groove and which extends at least a major proportion of the length of the groove,



thereafter effecting the engagement of the outer surface of the tread ribs with the pressing element, said temporary support member being engaged by the pressing element and transmitting the pressing action of the pressing element to the bottom wall of the groove so as to aid in applying pressure uniformly over the undertread portion of the tread strip, and thereafter removing said pressing element and said support member.

3,933,552

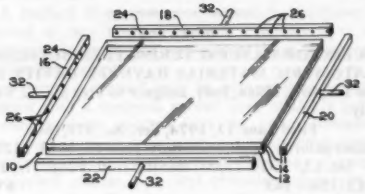
PREPARING TRANSPARENT ASSEMBLIES FOR LAMINATION

Lyle L. Shumaker, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 10, 1974, Ser. No. 487,333

Int. Cl.² C03C *27/10*

U.S. Cl. 156—104 **10 Claims**



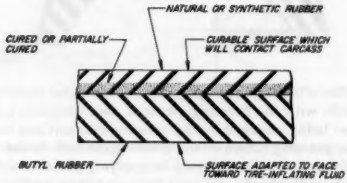
1. In a method of laminating safety glass assemblies comprising a sheet of flexible interlayer material and at least one sheet of relatively rigid, transparent material having at least a portion of its major surface in a non-smooth condition comprising assembling said sheet of flexible interlayer material intermediate two sheets of relatively rigid, transparent material with a non-smooth surface of said relatively rigid transparent material facing a surface of said interlayer material, prepressing said assembly by roll forming and subjecting said assembly to elevated heat and pressure to complete the lamination, the improvement comprising enclosing said assembly within a peripheral evacuation chamber thinner than the thickness of said assembly and disposed entirely inward of the outer major surfaces of said assembly to form a package, said evacuation chamber communicating with the interfacial surface between said rigid sheet and said interlayer, heating said package to a temperature sufficient to soften said interlayer material, evacuating said evacuation chamber to withdraw any air, gas and/or moisture from the interfacial surfaces, maintaining a pair of nipper rolls spaced apart a distance approximately equal to the thickness of the assembly, and passing said package between said nipper rolls so spaced while said interlayer material is sufficiently hot to be softened and while continuing said evacuation of said peripheral chamber to prepress said assembly and prepare said assembly for final

lamination at elevated temperature and pressure in an autoclave.

3,933,553
TIRES, ETC

Theophilus K. Seiberling, Akron, Ohio, assignor to Mildred Kelley Seiberling, Arkon, Ohio, a part interest

Continuation of Ser. No. 321,421, Jan. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 838,512, July 2, 1969, abandoned. This application Sept. 7, 1973, Ser. No. 395,346
Int. Cl.[2] B29H *17/16*
U.S. Cl. 156—123 **3 Claims**

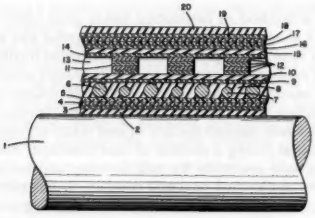

NATURAL OR SYNTHETIC RUBBER
CURED OR PARTIALLY CURED
CURABLE SURFACE WHICH WILL CONTACT CARCASS
BUTYL RUBBER
SURFACE ADAPTED TO FACE TOWARD TIRE-INFLATING FLUID

1. The method of making a liner for a pneumatic tire, which liner is composed of a plurality of rubber layers, which method comprises curing or partially curing the surface and the underlying stratum of a layer of the liner without curing the inner layer of the liner which layer is a butyl rubber and which is adapted to face toward subsequent tire-inflating fluid, and without completely curing the surface of the liner which is adapted to contact the tire carcass and laminating the layers, the uncured inner layer and the surface which is adapted to contact the tire carcass being otherwise suitable to be joined by a good seal when the ends of the liner are united.

3,933,554
PROCESS FOR MANUFACTURING FLEXIBLE HOSES OF ELASTOMERIC MATERIAL HAVING A CAVITY WALL

Flavio Torghele, Milan, Italy, assignor to Treg S.p.A., Veniano, Italy

Filed June 13, 1974, Ser. No. 479,166
Claims priority, application Italy, June 13, 1973, 25297/73
Int. Cl.[2] B31C *13/00*; B65H *81/00*; F16L *11/12*
U.S. Cl. 156—143 **4 Claims**



1. A process for manufacturing reinforced hoses of elastomeric material having a hollow space in their wall, comprising the steps of:

building up about a rigid support a first continuous tubular layer of elastomeric material containing a reinforcing structure;

positioning about said first tubular layer a helicoid with a hollow space existing between each adjacent coil, said helicoid being of a structural shape of elastomeric material reinforced in such a way as to be practically indeformable to pressure stresses in the direction of its thickness;

building up a second continuous tubular layer about the helicoid of structural shape, said tubular layer being in contact with the outer surface of said structural shape;

filling the hollow space between each adjacent coil of said helicoid with incompressible material, inert to the effects of vulcanization;

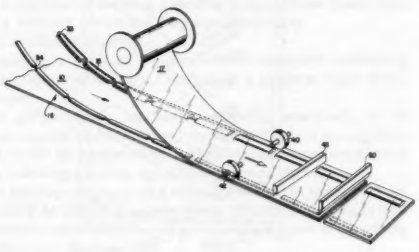
curing the obtained unit in an autoclave under pressure;

removing in liquid state the inert material filling the hollow space.

3,933,555
METHOD OF MANUFACTURING PHOTOGRAPHIC FILM UNIT

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 140,537, May 5, 1971, Pat. No. 3,752,722. This application July 2, 1973, Ser. No. 375,340
Int. Cl.[2] B32B *31/08*; G03C *3/00*
U.S. Cl. 156—155 **10 Claims**



1. A method of forming an integral diffusion transfer photographic film unit which comprises first and second sheet elements adhered to one another in opposed relationship, at least one of said sheet elements comprising a layer comprising image-forming materials and at least one of said sheet elements comprising an image-receiving layer, which method comprises:

securing adjacent a longitudinal edge of an extended length of said first sheet element, sequentially, a multiplicity of rupturable containers retaining diffusion transfer processing composition so that upon the application of compressive force to a container the contents thereof will be directed toward the longitudinal edge of said first sheet element opposed to the edge adjacent to which said containers are secured;

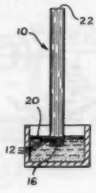
superposing an extended length of said second sheet element over said first sheet element and securing said second sheet element to said first sheet element by sealing said sheet elements each to the other along at least the longitudinal edge of said superposed elements opposed to the edge adjacent to which said rupturable containers are secured, and sealing the transverse areas normal to said longitudinal seal lying between said sequentially secured containers of processing composition, thereby establishing a composite film unit capable of retaining distributed processing composition; and

severing said composite film units from said extended lengths of said first and second sheet elements through sealed traverse areas.

3,933,556
FIBER OPTIC IMAGE SHAPE CONVERTER AND METHOD OF MAKING THE SAME

Richard R. Strack, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 10, 1974, Ser. No. 432,274
Int. Cl.² B32B *17/04*; G02B *5/14*
U.S. Cl. 156—155 **7 Claims**



1. The method of making a fused glass clad glass image transporting and shape converting device from a section of fused glass optical fiber conduit having a multiplicity of juxtapositioned individually flexible light-conducting fibers all rigidly fused together with a leachable glass matrix and said fibers being substantially indentically geometrically patterned at least at opposite ends of said conduit wherein said method comprises the steps of:

leaching said glass matrix away from said fibers adjacent a first end of said conduit;

replacing said leached matrix with a non-leachable bonding material;

covering the opposite second end of said conduit with a protective cap of non-leachable material to protect the fused glass clad glass integrity thereof;

leaching said matrix away from said fibers throughout the extent of said conduit between said non-leachable bonding material and said cap to render said fibers of said conduit and said conduit as a whole intermediately flexible;

separating said fibers into a plurality of groups at said first end of said conduit each group being of a preselected size and shape by cutting between said fibers longitudinally thereof through said non-leachable bonding material;

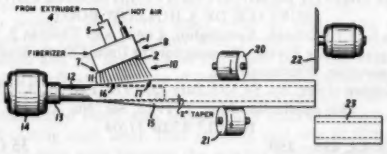
assembling said groups of fibers into a predetermined pattern differing in geometrical configuration from that of said first end of said conduit; and

removing said cap at any preselected stage of said method following said last mentioned leaching step.

3,933,557
CONTINUOUS PRODUCTION OF NONWOVEN WEBS FROM THERMOPLASTIC FIBERS AND PRODUCTS

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,688
Int. Cl.² D04H *3/16*
U.S. Cl. 156—167 **18 Claims**



1. A process for forming nonwoven webs of thermoplastic fibrous material in a seamless cylindrical configuration and in continuous lengths, which comprises spinning molten thermoplastic material from a multiplicity of orifices arranged at an angle to a rotating mandrel so that some orifices are at a greater distance from the mandrel than others, and some fibers travel over a greater distance than others, before they are collected on the mandrel, applying a gas blast at the orifices of the spinning die directed generally in the direction of projection of the fibers from the orifices, so as to attenuate and disrupt the fibers into discrete lengths; collecting and winding the resulting discrete lengths of fibers directly on a rotating mandrel to form thereon a generally spirally wound cylindrical layer of randomly oriented heterogeneously intertwined spun fibers of controlled density, and moving the resulting seamless spirally wound cylindrical fibrous layer in a continuous length axially on the mandrel away from the trajectory of fibers.

3,933,558
METHOD OF PROCESSING LAMINATED DECORATIVE SHEET FOR IMPARTING PERMANENT SHAPE THERETO

Yasushi Takahata; Akira Karimori, both of Fuji; Toshiya Kato, Nagoya, and Katsuo Nomura, Inuyama, all of Japan, assignors to Kohjin Co., Ltd., Tokyo and Aika Kogyo Co., Ltd., Aichi, both of, Japan

Filed May 25, 1973, Ser. No. 364,186
Claims priority, application Japan, May 29, 1972, 47-52445
Int. Cl.² B31F *1/00*; B44C *1/24*
U.S. Cl. 156—209 **7 Claims**

1. A method of processing a laminated decorative sheet composed of two layers comprising a surface layer and a support layer for imparting a permanent shape thereto, which comprises the steps of:

a. preparing a support layer by impregnating a first base paper with a synthetic rubber latex and/or a synthetic resin emulsion selected from the group consisting of styrene-butadiene copolymer, acrylonitrilebutadiene copolymer, methyl methacrylate-butadiene copolymer, polyvinyl acetate, polyvinyl chloride, polyacrylate and mixtures thereof; or by incorporating said synthetic rubber latex and/or said synthetic resin emulsion into a pulp slurry for the base paper by wet end addition, wherein said support layer contains the synthetic rubber and/or synthetic resin emulsion in an amount of at least 22.72 percent by weight;

b. preparing a surface layer by impregnating a second base paper with a thermosetting resin selected from the group consisting of diallyl phthalate resin, benzoguanamine resin, unsaturated polyester resin and mixtures thereof; or by coating said thermosetting resin on the support layer obtained in a) above, the thickness of said surface layer being such that the laminate is flexible and capable of being embossed at pressures as low as 10 kg/cm²;

c. laminating said surface layer and said support layer at a temperature of from 100° to 200°C under a pressure of from about 4 to about 15 kg/cm² to cure the thermosetting resin in said surface layer and thereby obtain a laminated decorative sheet; and

d. embossing the laminated decorative sheet using a plane sheet embossing press under the following conditions: temperature within the range of 100°C to 200°C and pressure within the range of 10 kg/cm² to 13 kg/cm²; or embossing the laminated decorative sheet using a roll embosser under the following conditions: temperature within the range of 100°C to 200°C, and pressure within the range of 10 kg/cm to 30 kg/cm.

3,933,559
PROCESS FOR MANUFACTURING A BODY OF MOISTURE-PROOF CONTAINER FOR PACKAGING

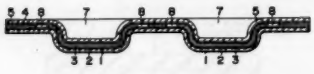
Tetsuo Watanabe, Kokubunji, Japan, assignor to Dai Nippon Printing Company Limited, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,410

Claims priority, application Japan, Aug. 7, 1973, 48-88030. The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.² B29C *17/03*; B32B *3/30*; B65D *85/42*

U.S. Cl. 156—211 15 Claims



1. A process for manufacturing a body of a moisture-proof container having at least two recesses for packaging purposes which comprises adhering a metal foil to a first thermoplastic resin film with a hot melt-type adhesive to form a laminated sheet, forming at least two closed blank portions in said laminated sheet by cutting only the metal foil, adhering a second thermoplastic resin film on the surface of the metal foil and stretch-forming said closed blank portions of the laminated sheet at a temperature wherein the hot melt-type adhesive and the thermoplastic resin films are softened, thereby forming said recesses.

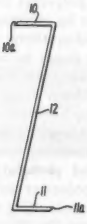
3,933,560
TAG WICKET

William H. Muttera, Walnut Creek, Calif., assignor to Dennison-Eastman Corporation, Richmond, Calif.

Filed July 23, 1973, Ser. No. 381,491

Int. Cl.² B31F *23/10*

U.S. Cl. 156—227 4 Claims



1. A method for forming a tag fastener without substantial waste and securing a tag thereto, comprising the steps: cutting a web of sheet-like material into a multiplicity of continuous thin nestable strips of material, each said strip comprising a pair of spaced, generally parallel end sections and an intermediate connector strip, the ends of said intermediate connector strip being integrally joined to one end of each end section to form a generally Z shaped configuration; folding each said strip at a point along the intermediate connector strip between the parallel end sections, thereby forming a generally triangular configuration having a base and an apex; and bonding a tag to the base of said triangular configuration.

3,933,561
PROCESS FOR MANUFACTURING ULTRATHIN POLYMER MEMBRANES AND PRODUCTS DERIVED THEREFROM

Roy E. Larson, St. Paul, and Ralph H. Forester, Jr., Minneapolis, both of Minn., assignors to North Star Research Institute, Minneapolis, Minn.

Filed Mar. 27, 1974, Ser. No. 455,059

Int. Cl.² B32B *31/00*

U.S. Cl. 156—246 10 Claims

1. A method for making unsupported ultrathin polymer film having autogenous bonding characteristics when moist comprising the steps of:

a. floating an ultrathin polymer film having an ultrathin caliper less than 2.5 microns on the surface of a liquid bath capable of supporting said ultrathin polymer film;

b. contacting a surface of the floating ultrathin polymer film with a surface of a flexible release substrate to form a flexible separable composite comprising said film having an exposed surface and said release substrate;

c. at least partially drying said separable composite;

d. applying a particulate anti-blocking agent to the exposed surface of said ultrathin polymer film portion of said composite and separating said ultrathin polymer film from said release substrate; and

e. retrieving the thus-separated, unsupported ultrathin polymer film in bulk form.

10. A method for making unsupported ultrathin polymer film having autogenous bonding characteristics when moist comprising the steps of:

a. floating an ultrathin polymer film having an ultrathin caliper less than 2.5 microns on the surface of a liquid bath capable of supporting said ultrathin polymer film;

b. contacting a surface of the floating ultrathin polymer film with a surface of a flexible release substrate to form a flexible separable composite comprising said film having an exposed surface and said release substrate;

c. at least partially drying said separable composite;

d. separating said ultrathin polymer film from said release substrate; and

e. retrieving the thus-separated, unsupported ultrathin polymer film in bulk form by feeding said ultrathin polymer film to a driven roller at a linear feed rate which alternatively is increased and decreased with respect to the linear speed of the periphery of the resulting convoluted roll.

3,933,562
METHOD OF LAMINATING A PLASTIC SHEET ONTO A SURFACE OF A HOLLOW BODY

Ira G. Cruckshank, Kensington, Conn., and Thomas J. Snodgrass, Lake Forest, Ill., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 54,533, July 13, 1970, Pat. No. 3,753,830. This application Mar. 1, 1973, Ser. No. 337,254

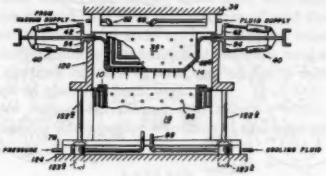
Int. Cl.² B32B *31/04*

U.S. Cl. 156—250 35 Claims

1. A method of making a two-piece laminated article wherein a first plastic sheet is formed into the shape of and secured to the inner surface of a hollow article, said method including the steps of:

a. loading said hollow article into a female die;

b. securing said plastic sheet in a clamping means;
c. heating said clamped sheet to its softening temperature;
d. moving said clamped heated sheet into registry with a male die and said female die;
e. sealing said female die in a sealed chamber one boundary of which is formed by said clamped sheet;
f. moving said male die toward said clamped heated sheet to form said clamped heated sheet about said male die;



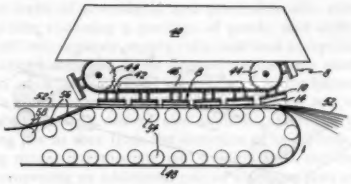
g. moving said male die and said clamped formed heated sheet against said surface of said hollow article in said female die; and
h. applying a fluid pressure differential to said clamped formed heated sheet to transfer said clamped formed heated sheet to said surface of said hollow article.

3,933,563

METHOD OF SEVERING AND EDGE-SEALING THERMOPLASTIC SETS OF FILMS

Richard S. Carlisle, 1051 Broadway, Thornwood, N.Y. 10594

Continuation-in-part of Ser. No. 256,850, May 25, 1972, abandoned. This application Jan. 24, 1973, Ser. No. 326,278
Int. Cl.² B32B *31/18, 7/06, 31/20*
U.S. Cl. 156—251 **2 Claims**



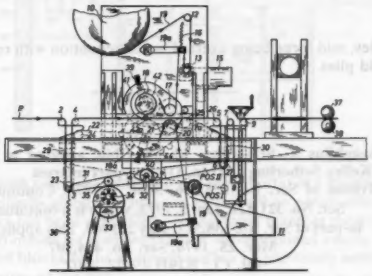
1. The method of making plural articles concurrently wherein each article comprises a set of films of thermoplastic material edge-sealed together, including the steps of forming a stack of multiple sets of heat-sealable thermoplastic films and at least one seal-inhibiting layer interposed between each set of films and the next, the seal-inhibiting layer being of a thermoplastic material laminated to a face of at least one of the films of each set, heating a blade well above the fusion temperature of the thermoplastic material, applying the blade with pressure against the stack while so heated and while supporting the stack against such pressure, the amount of pressure and the sharpness of the blade being less than that needed to effect die cutting of the stack in the absence of heat, the seal-inhibiting layer being of a material readily penetrated by the heated blade with less pressure than that needed for cold-cutting such layer, thus severing said sets of films and forming edge seals between the severed edges of each set of said films, and applying opposed pressure to the stack of severed sets of films at least adjacent the severed margins thereof while the material of said seals is in heat-softened condition for enhancing the seals.

3,933,564

METHOD OF AFFIXING LABELS TO A WEB OF SHEET OR FILM MATERIAL AND APPARATUS FOR CARRYING OUT SAID METHOD

Ole Roger Jensen, Copenhagen N, Denmark, assignor to A/S Rolles Fabriker, Denmark

Filed Apr. 10, 1973, Ser. No. 349,814
Claims priority, application Denmark, Aug. 22, 1972, 4155/72; Sept. 26, 1972, 4748/72
Int. Cl.² B32B *31/04*
U.S. Cl. 156—265 **6 Claims**



1. A method of affixing labels to a web of sheet or film material comprising the steps of:
stepwise advancing a film web into and out of said apparatus,
moving said advanced film web in synchronism with a label being affixed thereto by pivoting a tilting lever mounted to said apparatus, said tilting lever having rollers at each end thereof about which said film web is positioned,
feeding a web of labels to a vacuum roller,
attracting said labels to the surface of said vacuum roller,
cutting each label from the web of labels after each label is attracted to the surface of said vacuum roller, and
rotating said vacuum roller by said tilting lever slightly faster than the rate at which said web of labels is fed thereto to thereby separate the cut label from said web of labels, and
moving said vacuum roller against said film web and urging while rotating a label arranged peripherally thereon against said film web to affix the label to the film web with a pure rolling motion and compressive action.

3,933,565

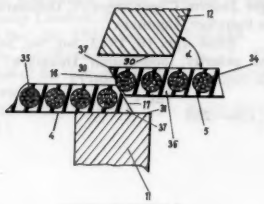
METHOD AND APPARATUS FOR BUTT CONNECTION OF PLIES FORMED OF PLASTIC DEFORMABLE MATERIAL, ESPECIALLY RUBBERIZED STEEL CORD PLIES

Gerhard Printz, Vienna, and Ralf Haase, Wien-Mauer, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Filed Nov. 19, 1973, Ser. No. 417,398
Claims priority, application Switzerland, Nov. 20, 1972, 16846/72
Int. Cl.² B65H *69/06*
U.S. Cl. 156—266 **13 Claims**

1. A method for the butt connection of plies formed of plastic deformable material, comprising the steps of beveling substantially parallel to one another cut surfaces of the plies which are to be interconnected, positioning such beveled cut surfaces of the plies so as to be in slight overlapping relationship with respect to one another and with the plies located in

different substantially horizontal planes, and then connectably joining together the plies by the application of a force to said



plies, said force being exerted at an inclination with respect to said plies.

3,933,566

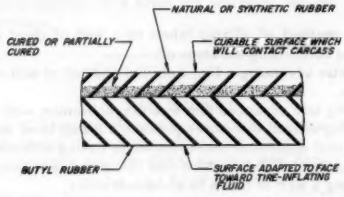
TIRES, ETC.

Theophilus K. Seiberling, Akron, Ohio, assignor to Mildred Kelley Seiberling, Akron, Ohio, a part interest

Division of Ser. No. 395,346, Sept. 7, 1973, Continuation of Ser. No. 321,421, Jan. 5, 1973, which is a continuation-in-part of Ser. No. 838,512, July 2, 1969. This application Mar. 25, 1974, Ser. No. 454,207

Int. Cl.² B29H *19/02, 5/02*

U.S. Cl. 156—272 **32 Claims**


NATURAL OR SYNTHETIC RUBBER
CURED OR PARTIALLY CURED
CURABLE SURFACE WHICH WILL CONTACT CARCASS
BUTYL RUBBER
SURFACE ADAPTED TO FACE TOWARD TIRE-INFLATING FLUID

1. The method of making a liner for a pneumatic tire which liner is composed of a plurality of layers which method comprises, without completely curing the outer surface of the liner which is the surface adapted to contact the carcass of the tire, curing or only partially curing by irradiation at least a portion of one layer of the liner and thereby rearranging the molecular structure thereof, all without curing the inner layer which is the layer adapted to face toward subsequent tire-inflating fluid, which portion is substantially coextensive with the layer and thereby rearranging the molecular structure thereof, and laminating said layers.

3,933,567

APPARATUS FOR HEAT BONDING FLUOROCARBON AND OTHER PLASTIC FILMS TO METAL SURFACES

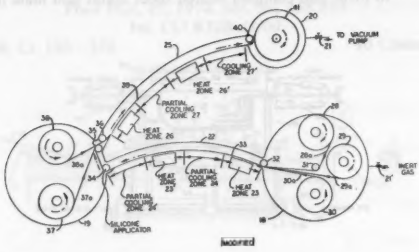
Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co., Houston, Tex.

Division of Ser. No. 401,656, Sept. 28, 1973, and a continuation-in-part of Ser. No. 311,137, Dec. 1, 1972, which is a continuation of Ser. No. 41,375, May 28, 1970, abandoned. This application Aug. 1, 1974, Ser. No. 493,890

Int. Cl.² B32B *15/08*

U.S. Cl. 156—382 **11 Claims**

1. Apparatus for bonding a plastic film to a metal surface comprising a fluid-tight closed system including first, second and third fluid-tight containers or vessels, a first fluid-tight conduit connecting the first and second containers and a second fluid-tight conduit connecting the second and third containers, means for supplying vacuum to the entire system including the containers and conduits, a continuous roll for supplying thin sheet metal mounted within the first container, means for passing the strip of metal continuously from the first container through the first conduit to the second container then through the second conduit to the third container, means for supplying at least one layer of plastic film to one side of the metal strip from the first container and means for passing it with the metal strip through the conduits and second con-



tainer to the third container, means within the second container for supplying at least one layer of thin plastic film to the other side of the metal strip, means for passing the same with the metal strip to the third container and heating means including first and second heating members for applying heat to the first and second conduits respectively, sufficient to bond the plastic film to the metal sheet.

3,933,568

APPARATUS FOR MANUFACTURING A WRAPPER WEB PROVIDED WITH A TEAR-OPEN STRIP

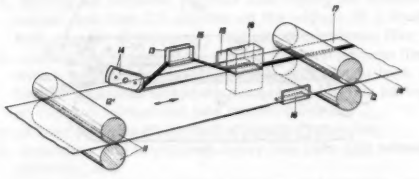
Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Oct. 3, 1973, Ser. No. 403,306

Claims priority, application Germany, Oct. 18, 1972, 2250932

Int. Cl.² B32B *31/20, 35/00*

U.S. Cl. 156—512 **5 Claims**



1. Apparatus to manufacture a wrapper web provided with a tear-open strip, the apparatus comprising, in combination:

feeder means to feed a web of wrapper material in a given direction along a first path including a planar portion;

cutter means comprising two cutter elements disposed at a predetermined spacing apart in a direction perpendicular to said given direction and adapted to make mutually parallel longitudinally extending incisions in said web of wrapper material to sever therefrom a strip having its width defined by said predetermined spacing and on each of mutually opposite sides of said incisions to leave a respective web piece having a width substantially greater than that of said strip;

first guide means comprising means protruding from said planar portion of said first path to define a ramp surface extending from and inclined at an acute angle with respect to said planar portion to cause a portion of said web traversing said protruding means to be guided along said ramp surface and out of the plane of said planar portion of said first path and to guide said strip along a second path, said second path being convergent with said planar portion of said first path downstream of said first guide

means, said cutting means co-operating with said protruding means to make said incisions in said web;

second guide means having respective guide elements spaced apart in a direction perpendicular to said given direction at a distance substantially equal to the sum of the respective widths of said web pieces, said guide elements being operatively associated with said planar portion of said first path downstream of said first guide means to guide said web pieces into mutually abutting edge-to-edge relationship;

third guide means operatively associated with said planar portion of said first path downstream of said first guide means to guide said strip into overlapping relationship with longitudinally extending and mutually next adjacent edge portions of each of said web pieces in said planar portion of said first path; and

connector means to connect said strip — when in said overlapping relationship — to each of said edge portions.

3,933,569

TOOL FOR WELDING TOGETHER TWO PLASTICS FILMS WRAPPING AN OBJECT

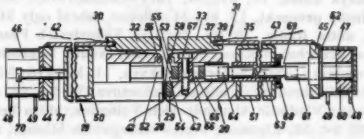
Halvor Gråsvoll, Stigbergsliden 16, S-414 63 Goteburg, Swekov, ulitsa Lenina, 26, kv. 21, Efremov, all of U.S.S.R.

Filed Mar. 18, 1974, Ser. No. 452,212

Claims priority, application Sweden, Mar. 19, 1973, 7303772

Int. Cl.² B65B *9/12, 51/30*

U.S. Cl. 156—515 **5 Claims**



1. An improved tool for interconnecting by means of welding two webs of a weldable and preferably also extensible plastics film enclosing a package of goods, said webs being reeled off two separate supply rolls, said tool comprising two tool sections arranged to be pressed against one another, a face on each tool section being positioned adjacent said goods, a clamping jaw on each said section face, two welding units positioned on one of said sections externally of said clamping jaw as seen from the direction of said goods, and a severing means intermediate said welding units, the improvement comprising an additional pair of clamping jaws on each said tool section, said additional clamping jaws arranged to securely clamp the associated film web at a point between the supply roll of the latter and the intended welding point, and also means for releasing said film from said additional two pairs of clamping jaws immediately after or exactly during the joining together of said tool sections, said welding units being arranged to thereafter initiate the welding operation.

3,933,570

PANEL MANUFACTURING MACHINE AND METHOD

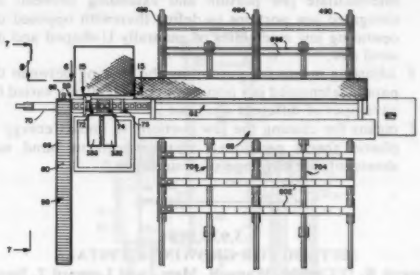
Lawrence W. Wright, Scottsdale; Leon H. Tolleson; Daniel P. Abrahamson, both of Phoenix; Paul M. Thomas, Paradise Valley, and Eugene E. Crile, Phoenix, all of Ariz., assignors to The Thomas 1970 Trust, Phoenix, Ariz.

Continuation of Ser. No. 132,788, April 9, 1971, abandoned, which is a division of Ser. No. 138,949, April 30, 1971, Pat. No. 3,789,101. This application Oct. 3, 1973, Ser. No. 403,056

Int. Cl.² E04G *21/14*

U.S. Cl. 156—558 **27 Claims**

1. In a wall panel manufacturing machine the combination of: a frame, an elongated makeup table adapted to support an elongated course of blocks including a plurality of concrete blocks in end-to-end relation with each other on said table; first means for progressively conveying blocks on to one end of said makeup table; second means for progressively inserting mortar between the adjacent ends of said blocks for forming head joints therebetween; third means for placing mortar on the upper surfaces of said blocks to form bed joints thereon; fourth means for progressively advancing a plurality of said



blocks with said head joints and bed joint mortar in a direction longitudinally along said makeup table until an entire course of blocks has been assembled and mortared together thereon; and fifth means for transferring said last-mentioned course of mortared blocks on to an upper surface of previously assembled course or the like.

3,933,571

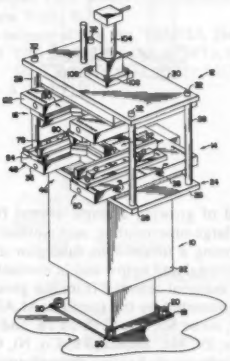
SEALING APPARATUS UTILIZING ADJUSTABLE JAW PORTIONS

Charles E. Studen, Highland Heights, Ohio, assignor to Donray Products Company, Cleveland, Ohio

Division of Ser. No. 183,102, Sept. 23, 1971, abandoned. This application May 21, 1973, Ser. No. 361,977

Int. Cl.² B30B *7/04;* **B32B** *3/02, 31/20*

U.S. Cl. 156—583 **5 Claims**



1. Apparatus for forming sealed foam plastic envelopes of a given desired size comprising:

a. a pair of platens having opposed faces;

b. support means for supporting said platens with their opposed faces generally parallel and in alignment;

c. power means for producing relative movement between said platens to permit them to be selectively moved from a first position wherein their opposed faces are spaced a substantial distance apart to a second position wherein their opposed faces are relatively closely spaced;

d. adjustable jaw assembly means carried on each of said platens, each of said jaw assembly means including at

least three margin defining jaw portions fixed in desired relation on each platen, the jaw portions including one pair of elongated jaw portions in side-by-side parallel alignment on each platen and arranged to mate in face-to-face relation when the platens are moved to the second position, and an intermediate jaw portion mounted on each platen in face-to-face relation with its opposing intermediate jaw portion and extending between the elongated jaw portions to define therewith opposed co-operating jaw assemblies of generally U-shaped and desired size;

e. adjusting means for permitting the spacing between the parallel elongated jaw portions to be selectively varied for envelopes of different size; and,

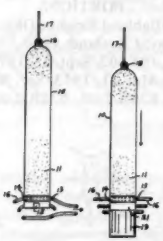
f. means for causing the jaw portions to impart energy to plastic sheets positioned therebetween to bond said sheets into an envelope of desired size.

3,933,572

METHOD FOR GROWING CRYSTALS

Joseph R. O'Connor, Waquoit, Mass., and Leonard J. Small, Sunnyvale, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1973, Ser. No. 423,857
Int. Cl.² B01J *17/10*
U.S. Cl. 156—608 **7 Claims**



1. A method of growing a single crystal from a material which exhibits large supercooling, said method comprising the steps of positioning a foraminous susceptor above and adjacent to a seed crystal and below and in contact with a column of crystal feed material selected from the group consisting of compounds represented by the formulas M_3AB_3 and $M_4A_2B_5$, wherein A is P, As or Sb; B is S, Se or Te; and M is Na, K, Li, Ba, Ca, Mg, Be, Zr, Mn, Zn, Ce, Fe, Co, Ni, Cd, Pb, Sn, Cu, Ag, Au or Pt; inductively heating the susceptor so as to melt the top of the seed crystal and a layer of the column of the crystal feed material adjacent the susceptor; passing crystal feed material melt through openings in the susceptor into contact with the melted seed crystal, thereby commencing crystal growth; lowering the column toward the heated susceptor so as to melt the end of the column; passing the resulting melt through openings in the susceptor to provide material for continued crystal growth; and maintaining the temperature of the susceptor at a temperature such that the height of the melt on which the susceptor floats as measured between the lower surface of the susceptor and the interface between the melt and the grown crystal is in the range of about 2 to 10 millimeters.

3,933,573

ALUMINUM NITRIDE SINGLE CRYSTAL GROWTH FROM A MOLTEN MIXTURE WITH CALCIUM NITRIDE

Cortland O. Dugger, Newton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 419,459, Nov. 27, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 563,008
Int. Cl.² C01F *7/00*; B01J *17/06*
U.S. Cl. 156—624 **4 Claims**

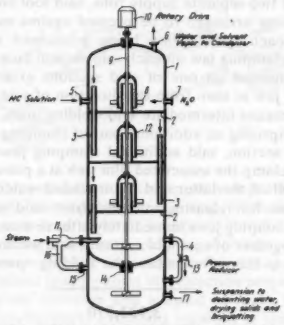
1. A method for growing aluminum nitride single crystals which comprises the steps of forming a mixture of (a) from about 8 to 40 mole percent of aluminum nitride, and (b) from about 92 to 60 mole percent calcium nitride; heating said mixture to a temperature above about 1525°C. and maintaining said temperature for a time sufficient to form a homogeneous molten solution thereof; slowly cooling the molten solution to a temperature above its freezing point at a rate of about 0.5° to about 3.0°C./hr. in order to effect the precipitation of single crystals of said aluminum nitride.

3,933,574

METHOD OF AND DEVICE FOR ISOLATION OF RUBBER-LIKE POLYMERS FROM HYDROCARBON SOLUTIONS

Alexandr Fedorovich Zinoviev, ulitsa Scherbakovskaya, 9, kv. 59; Boris Sergeevich Korotkevich, Fortunatovskaya ulitsa, 31/35, kv. 71; Sergei Timofeevich Petukhov, Fortunatovskaya ulitsa, 31/35, kv. 9; Izmail Mikhailovich Basiev, Zverinetskaya ulitsa, 14, kv. 58; Jury Alexandrovich Shmuk, Leninsky prospekt, 13, kv. 31; Ulchar Ashraf ogly Mamedov, ulitsa Radio, 20, kv. 26; Ilya Yakovlevich Poznyak, ulitsa Scherbakovskaya, 9, kv. 120; Naum Mikhailovich Starominsky, ulitsa Scherbakovskaya, 11, kv. 116; Nikolai Pavlovich Shmarovoz, ulitsa Lermontova, 34, kv. 58, all of Moscow; Vladimir Alexandrovich Volnakov, ulitsa Lenina, 27/40, kv. 38, Efremov; Viktor Georgievich Minaev, ulitsa Sverdlova 63, kv. 6, Efremov, and Alexei Semenovich Strukov, ulitsa Lenina, 26, kv. 21, Efremov, all of U.S.S.R.

Filed Aug. 7, 1973, Ser. No. 386,383
Int. Cl.² B01D *1/14, 1/26, 1/00*; C07D *211/00*
U.S. Cl. 159—16 S **5 Claims**



1. A method for isolating a rubber-like polymer from a solution thereof in a hydrocarbon solvent comprising adding water and vapor to the polymer solution with agitation at a temperature of 80°–180°C. to form an aqueous suspension of polymer granules and to evaporate the bulk of the solvent in a first steaming step; continuously delivering the suspension from the first steaming step to at least one intermediate steaming step wherein the suspension is agitated and treated with vapor at a temperature of 115°–180°C and then to a final flashing step wherein the vapor treated suspension from the intermediate step is agitated at a temperature of 90°–110°C. to remove final traces of solvent; discharging the polymer

suspension from the final flashing step; separating the polymer from water; and drying the polymer; and wherein the solvent vapors and steam are continuously withdrawn in each step counterflow to the flow of the polymer suspension.

3,933,575

SEPARATION OF CORROSIVE LIQUID MIXTURES

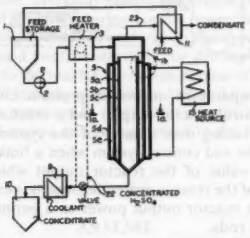
Hans Guth, Berg. Neukirchen; Hans-Joachim Kaiser; Klaus Kleine-Weischede, both of Leverkusen; Hermann Wieschen, Cologne, all of Germany, and Hans L. Kuhnlein, Fullinsdorf, Switzerland, assignors to HCH. Bertrams Aktiengesellschaft, Basel, Switzerland and Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 15, 1974, Ser. No. 442,937

Claims priority, application Germany, Mar. 6, 1973, 2311085

Int. Cl.² B01D *1/22, 1/00;* **C01B** *17/90;* **B41D** *3/00*

U.S. Cl. 159—DIG. 19 **7 Claims**



1. In the processing of aqueous sulfuric acid of about 50 to 80% concentration by its passage over one surface of a wall of inert heat resistant material, and heating the opposite surface of said wall, thereby to evaporate water from said sulfuric acid, the improvement which comprises heating the opposite surface of said wall by contact with a molten metal which is normally solid at ambient temperature and which is inert with respect to sulfuric acid, heating said molten metal indirectly through heat exchange with a molten salt which is normally solid at ambient temperature, and heating and re-circulating said salt, whereby in the event of perforation of said wall the sulfuric acid is kept separate from the molten salt by said molten metal.

3,933,576

EVAPORATION OF RADIOACTIVE WASTES

William E. Rushton, South Holland, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed May 17, 1973, Ser. No. 361,208

Int. Cl.² B01D *1/26, 1/100, 1/06;* **C09K** *3/00*

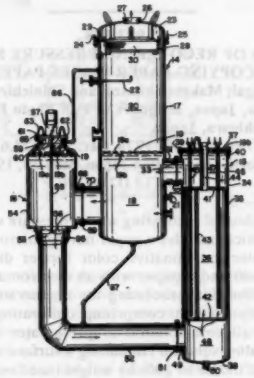
U.S. Cl. 159—27 A **13 Claims**

1. An evaporator system for liqueform material for operation within a radiation shield providing access to the system from overhead, said evaporator system comprising, in combination:

chamber means for said liqueform material, said chamber means defining first and second apertures on a top portion thereof, and said liqueform material having maximum and minimum operating levels within said chamber means;

means comprising a vertical heat exchanger for heating said fluid, said heat exchanger including a first top plate removably mounted over said first aperture in said chamber means and a steam chest suspended from first said top plate, said steam chest being submerged in said chamber means below said minimum liquid operating level and being removable from said system through said aperture;

means comprising a circulation pump for circulating said liqueform material through said system, said circulation pump including a second top plate removably mounted over said second aperture in said chamber means, a motor mounted on said second top plate, a propeller, flow confining means in said chamber means below said minimum liquid level for said propeller, a shaft depending from said motor for supporting said propeller within said flow confining means below said minimum operating



level, said propeller and shaft being removable from said system through said second aperture, said first and second apertures being above said maximum liquid operating level and of sufficient dimensions to enable said circulation pump and said heat exchanger to be removed from said system from overhead, and a vapor exhaust port in said chamber means above said maximum liquid level.

3,933,577

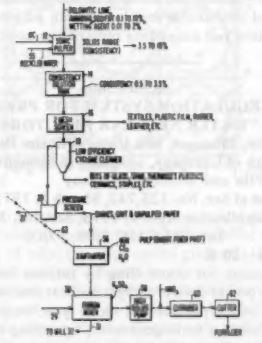
PROCESS OF SONICALLY TREATING MUNICIPAL WASTE TO PRODUCE HIGH QUALITY PAPER PULP AND FERTILIZER

Ronald A. Penque, Glen Ridge, N.J., assignor to Biocel Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 105,123, Jan. 8, 1971, Pat. No. 3,850,771. This application Oct. 9, 1973, Ser. No. 404,305

Int. Cl. D21b *1/32;* **D21c** *5/02*

U.S. Cl. 162—4 **35 Claims**



34. A process of treating paper and paper products containing contaminants to produce light long fiber pulp comprising subjecting the paper and paper products to pulping to prevent shearing of the fibers in the presence of water, a calcium or

magnesium compound or mixtures thereof, an ammonium compound, a solvent for the contaminants and a wetting agent at an alkaline pH to form a slurry of paper pulp and the added chemicals, reacting the slurry with phosphate ions to form a precipitate of calcium or magnesium ammonium phosphate or mixtures thereof carrying the contaminants therewith, and separating the pulp slurry from the precipitate, the pulp slurry containing long fiber decontaminated pulp.

3,933,578

METHOD OF RECOVERING PRESSURE SENSITIVE COPYING PAPER WASTE PAPER

Tsuneo Kasugai; Makoto Shimizu, and Shinichiro Ohara, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 30, 1974, Ser. No. 474,634
Claims priority, application Japan, May 30, 1973, 48-60457
Int. Cl.² D21C *5/02*
U.S. Cl. 162—5 **6 Claims**

1. In a method of recovering waste, pressure sensitive copying paper, which includes a paper having micro capsules containing an electron donative color former dissolved in an organic solvent and a paper with an electron attractive clay, including difibration processing for regenerating said waste paper, the improvement comprising: defibrating said paper in an aqueous alkaline solution of pH greater than 7.5, said aqueous alkaline solution containing a surface active agent in an amount of 0.01% to 20% by weight based on the weight of the waste paper to form a pulp, wherein color production in the pulp during defibration is inhibited.

3,933,579

VESICULATED POLYMER GRANULES

Robert William Kershaw; Frederick John Lubbock, and Livia Polgar, all of Victoria, Australia, assignors to Dulux Australia Limited, Melbourne, Australia

Continuation-in-part of Ser. No. 877,498, Nov. 17, 1969, abandoned. This application Aug. 4, 1971, Ser. No. 169,116
Claims priority, application Australia, June 28, 1971, 5329/71
Int. Cl.² D21D *3/00;* **D21H** *3/30;* **C08J** *9/00*
U.S. Cl. 162—164 **28 Claims**

1. Vesiculated polymer granules, said vesiculated granules having a plurality of discrete internal vesicles whose walls are provided by said polymer, said granules having a mean diameter of 1–500 micron, the ratio of granule diameter to the mean vesicle diameter being at least 5:1, the maximum diameter of the vesicles being 20 micron and the volume of the vesicles being from 5–95% of the volume of the granules and further characterized in that the vesicles contain particulate solids at a concentration not exceeding 60% of the vesicle volume.

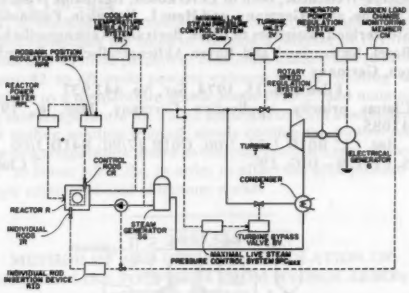
3,933,580

LIMIT REGULATION SYSTEM FOR PRESSURIZED WATER NUCLEAR REACTORS

Werner Aleite, Erlangen, and Heinz-Wilhelm Bock, Erlangen-Bruck, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 125,742, March 8, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,280
Int. Cl.² G21C *7/00, 17/00*
U.S. Cl. 176—20 R **7 Claims**

1. In a system for controlling by turbine inlet valves and control rods power delivered by a nuclear reactor of a nuclear power plant of the pressurized water type, the plant including a steam turbine, a turbogenerator, operating control means for controlling the system in the normal working range, and emergency means to shut down the reactor; the improvement comprising means to control intermediate disturbances in the range between and not controlled by the operating control means and the shut down means, minimal steam pressure control means for controlling the turbine inlet valves when the steam pressure drops below a certain value, turbogenerator protecting means, maximal steam pressure control means connected for activating the turbogenerator protecting means when the steam pressure exceeds a predetermined value, reactor protecting means and reactor control means for activating the reactor protecting means when the reactor output exceeds a predetermined value, a power controlling system comprising a rod control system responsive directly to reactor



coolant temperature means to position control rods and thereby control reactor output, and a reactor power limiting system for taking over control of the system to control the action of the rod control system when a limit value which is below the value of the reactor output which controls the activation of the reactor protecting means is exceeded thereby limiting the reactor output power to a permissible value via the control rods.

3,933,581

CONTROL ROD DRIVE FOR REACTOR SHUTDOWN

Ernest R. McKeehan, Los Gatos; Bruce M. Shawver; Donald J. Schiro, both of San Jose, and William E. Taft, Los Gatos, all of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,173
Int. Cl.² G21C *7/12, 7/16*
U.S. Cl. 176—36 R **5 Claims**

1. In combination, a control rod drive for scramming a nuclear reactor comprising: a control rod assembly; a latch mechanism for retaining and releasing said control rod assembly; a drive shaft assembly operatively connected to said latch

mechanism; and a control drive assembly operatively connected to said drive shaft assembly, said control rod assembly and said latch mechanism being positioned within an outer casing extending through a reactor core; said drive shaft assembly extending through a reactor closure; and said control drive assembly being located on a side of said reactor closure opposite said outer casing; said control rod assembly being composed of a control rod region, a piston connected at one end of said control rod region and having a cross-section larger than an adjacent cross-section of said control rod region, a damper mechanism connected to said control rod region at an end opposite said piston, and a coupling head connected to said damper mechanism, said coupling head being releasably retained in said latch mechanism; said control rod assembly being movably positioned within a guide tube mounted within said outer casing and defining a high pressure fluid annulus therebetween, wherein fluid passes from the high pressure plenum through apertures in the core support structure and flows upwardly along said annulus, said fluid being vented through apertures in said guide tube located adjacent the control rod region and into the upper portion of said control rod region, said fluid passing therethrough for cooling said control rod assembly during normal operating conditions and for producing hydraulic pressures on the upper surface of said piston of said control assembly for driving said control rod assembly into the reactor core upon release of said control assembly by said latching mechanism, and said fluid thereafter passing through openings in said piston into the lower end of the control rod region and being vented to the low pressure plenum.

3,933,582

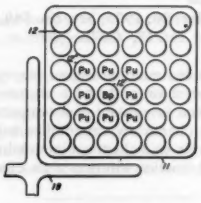
PLUTONIUM FUEL ADJACENT BURNABLE POISON

William V. MacNabb, Rockville, Md., assignor to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 156,454, Dec. 30, 1970, abandoned, which is a continuation of Ser. No. 762,946, Sept. 26, 1968, abandoned. This application Sept. 10, 1973, Ser. No. 395,827

Int. Cl. G21c *3/32*

U.S. Cl. 176—78 **2 Claims**



1. A fuel assembly for use in a nuclear reactor core comprising: a plurality of spaced apart elongated fuel elements, burnable poison in at least one of said fuel elements, fissile plutonium in all of the fuel elements which are adjacent said one of said fuel elements, the initial fissile fuel in the fuel elements which are more remote from said one of said fuel elements than said adjacent fuel elements consisting of fissile uranium whereby the initial power in said fuel adjacent said one of fuel elements in said core is increased relative to the initial power in said more remote fuel elements as compared to a similar fuel assembly wherein all of the initial fissile fuel consists of uranium.

3,933,583

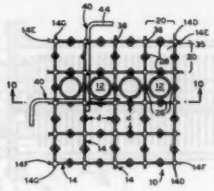
NUCLEAR FUEL ROD FRAME WITH FUEL RODS POSITIONED BY MOVEABLE MEMBER

Felix Stanley Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 774,148, Nov. 7, 1968, Pat. No. 3,665,586. This application Jan. 11, 1971, Ser. No. 105,388

Int. Cl.² G21C *3/34*

U.S. Cl. 176—78 **2 Claims**



1. In combination with a frame having resilient means for holding at least one movable nuclear fuel bearing member in place within a nuclear reactor wherein the resilient means is adapted to firmly hold the fuel member in a predetermined position with respect to the frame, the improvement comprising means other than the fuel bearing member for temporarily deflecting the resilient means to enable the fuel bearing member subsequently to be freely moved within the frame, said means further comprising at least one element inserted within the frame and rotatable therewithin and having portions thereon to selectively engage and deflect said resilient means in response to said rotation.

3,933,584

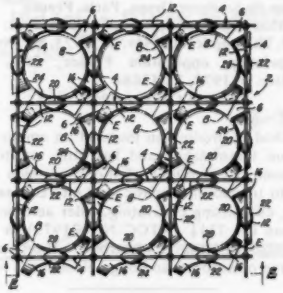
GRID FOR NUCLEAR FUEL ASSEMBLY

Kenneth C. Litt, Silver Spring, Md., assignor to Nuclear Fuel Services, Inc., Rockville, Md.

Filed Apr. 23, 1973, Ser. No. 353,448

Int. Cl. G21c *3/18, 3/34*

U.S. Cl. 176—78 **9 Claims**



1. A grid structure for a nuclear reactor fuel assembly comprising a plurality of members arranged to define the side walls of a plurality of adjacent open-ended grid cells through which elongated elements are adapted to extend;

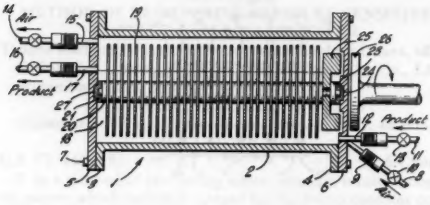
each of said side walls having an opening therethrough and extending across a major portion of the width thereof and communicating with an adjacent cell; and

substantially planar tabs of a length equal to a major portion of the width of said walls extending from edges of said openings into adjacent cells and extending oblique to the axes of said cells whereby to cause helical flow of a coolant flowing through said cells and intercell coolant mixing through said openings.

3,933,585
PROCESS FOR PRODUCTION OF VACCINES

William J. McAleer, Ambler, Pa. 19002; Raymond E. Spier, Guildford, Surrey, England, and Kenneth L. Posch, Lansdale, Pa. assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 262,825, June 14, 1972, abandoned. This application May 31, 1974, Ser. No. 475,063
Int. Cl.[2] A61K *39/12*; C12B *1/00*; C12K *7/00*
U.S. Cl. 195—1.1 5 Claims



1. A process for the production of a vaccine wherein the improvement comprises growing a desired virus in a rotating multiplate propagator having a plate diameter to internal tank diameter ratio of from about 0.80 to about 0.90.

3. A process for the production of a vaccine wherein the improvement comprises growing a desired virus in a rotating multiplate propagator having a distance of from about one-half inch to about three-fourths inch between the edge of the plates and the tank wall and having a plate diameter to internal tank diameter ratio of from about 0.80 to about 0.90.

4. A process for the production of a vaccine wherein the improvement comprises growing a desired virus in a multiplate propagator having a surface area to volume ratio of from about 1.7 cm.^{2}/ml. to 2.2 cm.^{2}/ml and having a plate diameter to internal tank diameter ratio of from about 0.80 to about 0.90.

3,933,586
METHOD OF MAKING L-ASPARTIC ACID FROM FUMARIC ACID

Nguyên-Công Duc, Nesle, France, assignor to Les Produits Organiques du Santerre Orsan, Paris, France

Continuation-in-part of Ser. No. 394,868, Sept. 6, 1973, abandoned. This application Nov. 26, 1973, Ser. No. 418,863
Claims priority, application France, Sept. 7, 1972, 72.31655; Dec. 8, 1972, 72.43684
Int. Cl.[2] C12D *13/06*, *13/10*
U.S. Cl. 195—65 22 Claims

1. A method of production insitu of an amino-transferase which is non thermolabile and has little sensitivity to the physical-chemical conditions of the conversion media and being able to transform furmaric acid into L-aspartic acid at a high rate, comprising cultivating under aerobic conditions Pseudomonas PO 7111 (ATCC No. 21973) in a nutritive medium containing a source of carbon, a source of phosphorous, a source of nitrogen and oligo-elements.

3,933,587
METHOD FOR PRODUCTION OF IMMOBILIZED ENZYME

Hidekatsu Maeda, Chiba; Aizo Yamauchi, Yokohama; Hideo Suzuki, and Akira Kamibayashi, both of Chiba, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 23, 1973, Ser. No. 418,264
Claims priority, application Japan, Dec. 7, 1972, 47-122860
Int. Cl. C07g *7/02*
U.S. Cl. 195—68 5 Claims

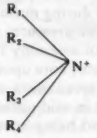
1. A method for the production of an immobilized enzyme, which comprises adding a radioresistant enzyme to the aqueous solution of a polyvinyl type high molecular compound selected from the group consisting of polyvinyl alcohol and polyvinyl pyrrolidone and irradiating the resultant mixture with ionizing radiant rays for thereby gelling the mixture.

3,933,588
ENZYME TREATMENT

Robert G. Dworschack, Clinton, Iowa; William H. White, Fulton, Ill., and James C. Chen, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 191,817, Oct. 22, 1971, abandoned. This application Aug. 23, 1974, Ser. No. 499,818
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—68 9 Claims

1. A method of improving the storage stability of enzymes which are immobilized intracellularly or immobilized in or on an inert carrier comprising treating an immobilized enzyme preparation consisting essentially of immobilized enzymes and water with an amount of a compound having the following formula:



where R_1 is a radical containing at least 10 carbon atoms, R_2 is a radical containing from 1 to 20 carbon atoms, and R_3 and R_4 are radicals containing not more than 6 carbon atoms, the radicals being selected from the group consisting of alkyl, substituted alkyl, alkene, aryl, substituted aryl, aralkyl, and saturated and unsaturated cyclic wherein the cyclic radical is formed by joining R_3 and R_4, and when the cyclic radical is unsaturated, there is no R_2, the amount of the compound being sufficient to increase the storage stability of said immobilized enzymes as compared to the storage stability of immobilized enzymes which have not been treated with said compound.

3,933,589
CHEMICAL IMMOBILIZATION OF ENZYMES

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 20, 1975, Ser. No. 560,308
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—68 19 Claims

1. In the process for immobilizing an enzyme on a support, wherein an enzyme, a support and a chemical immobilizing agent are maintained in contact at a temperature and for a time sufficient to chemically immobilize said enzyme, the improvement wherein said chemical immobilizing agent comprises a preformed reaction solution of an alkane diamine and alkane dihalide.

3,933,590
METHOD OF CONTINUOUSLY CULTURING YEAST

Takeshi Oguma; Shunji Shiba; Nobuo Moritani, all of Gotsu, and Yoichi Takeuchi, Hosoyama, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed June 25, 1974, Ser. No. 482,908
Claims priority, application Japan, Nov. 6, 1973, 48-124030
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—91 3 Claims

1. A method of continuously culturing yeast in a vapor condensate, comprising:

adding a neutralizing agent and nutritive agents to the vapor condensate produced from the evaporation of spent sulfite liquor;

inoculating said vapor condensate with a sulfurous acid resistant strain of Candida, Pichia or Hansenula yeast;
continuously culturing said yeast in said inoculated vapor condensate at a pH of 4.5 to 5.5; and
continuously supplying unsterilized vapor condensate to control the sulfurous acid concentration and the pH of said inoculated vapor condensate, wherein the concentration of sulfurous acid in said vapor condensate is from 0.02 to 0.20%.

3,933,591

PROCESS FOR PREPARING INTRACELLULAR SUBSTANCES OF MICROBIAL ORIGIN

Jaroslav Dasek, Yverdon, and Knut Rude Traelnes, Renens, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Apr. 27, 1973, Ser. No. 355,014
Claims priority, application Switzerland, May 3, 1972, 6589/72
Int. Cl.² C12B *1/00*
U.S. Cl. 195—96 **8 Claims**

1. In a process for preparing intracellular substances of microbial origin, which comprises culturing a microorganism in a suitable nutrient medium therefor, mechanically rupturing the walls of at least a part of the microorganism cells and recovering the intracellular substances released by such rupture, the improvement which comprises adding to said medium at least one antibiotic in an amount sufficient to weaken the walls of the microorganism cells but insufficient to arrest growth of the microorganism cells or to induce discharge of intracellular substances into said medium, whereby cells exhibiting such weakened cell walls are cultured.

3,933,592

METHOD OF DETECTING LIVING MICROORGANISMS

John R. Clendenning, Washington, D.C., assignor to Hazleton Laboratories, Incorporated, Vienna, Va.

Continuation of Ser. No. 433,488, Feb. 17, 1965, abandoned. This application Oct. 5, 1970, Ser. No. 78,241
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **18 Claims**

1. A method for testing an unknown sample of material, said sample containing substantially no adenosine triphosphate which is not in living microorganisms therein, and said material being suspected to contain living microorganisms which comprises:
a. treating said sample to render adenosine triphosphate in any living microorganisms present therein available for reaction,
b. contacting said sample with an adenosine triphosphate-reactive mixture comprising luciferin, luciferase, and a cation in the presence of oxygen, and
c. measuring the light emission from any ensuing reaction, said light emission being indicative of the presence and amount of living microorganisms in said sample.

3,933,593

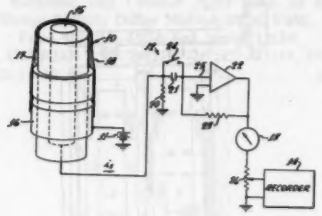
RATE SENSING BATCH ANALYSIS METHOD

James C. Sternberg, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 117,632, Feb. 22, 1971, abandoned, which is a division of Ser. No. 618,859, Feb. 27, 1967. This application Aug. 9, 1972, Ser. No. 279,011
Int. Cl. G01h *31/14*
U.S. Cl. 195—103.5 R **46 Claims**

1. A method of determining the concentration or activity of a material present in a sample which is chemically reacted in batch comprising:
monitoring a property or characteristic of a component or product of said reaction related to concentration of a substance in said batch;
generating a first electrical signal related to said concentration of said substance;
differentiating said first signal to obtain an output signal proportional to the instantaneous time rate of change of concentration of said substance; and
measuring said output signal to determine the concentration or activity of said material.

27. A method of directly determining the activity of an enzyme comprising:



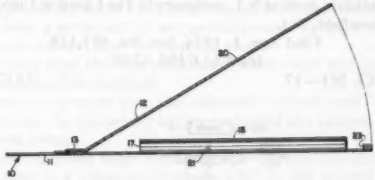
reacting said enzyme with an excess of substrate;
monitoring a property or characteristic of a component or product of the reaction related to concentration of a substance therein and generating a first electrical signal related to said concentration;
differentiating said first electrical signal to produce an output signal proportional to the instantaneous time rate of change of said concentration; and
measuring said output signal to determine the activity of said enzyme.

3,933,594

METHOD AND DEVICE FOR DETERMINING THE CONCENTRATION OF A SUBSTANCE IN A FLUID

Terry W. Milligan, Belmont, and Richard F. Wright, Acton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 16, 1974, Ser. No. 498,022
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R **10 Claims**

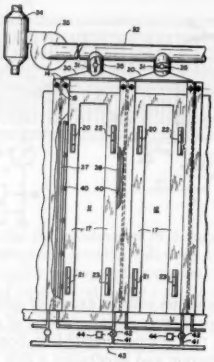


1. A device for determining concentrations of a substance in a fluid which comprises:
a first sheet carrying deformable support members;
said support members carrying an absorbent fluid receiving medium spaced apart from said first sheet;
a second sheet pivotally attached at one end to said first sheet and adapted to be superposed over said absorbent fluid receiving means; at least one of said first and second sheets is transparent, and said first sheet carrying one or more reagents; said reagents being present in a predetermined concentration and adapted to react with said substance to provide a visual indication of the concentration of said substance.

3,933,595
OVEN DOOR FUME COLLECTION SYSTEM

Gerome Gordon, Harding Township, Morris County, and Paul V. Faber, Morristown, both of N.J., assignors to Wilputte Corporation, Murray Hill, N.J.

Filed June 21, 1974, Ser. No. 481,665
Int. Cl.² C10B *27/00, 25/02*
U.S. Cl. 201—2 **8 Claims**

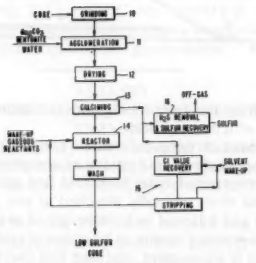


1. In a battery of coke ovens provided with a plurality of upright outwardly extending buckstays positioned along a side thereof and a plurality of vertically elongated door openings positioned between the buckstays the improvement comprising a pair of upright fluid conductors one positioned along each side of a door opening outside thereof between the door opening and its adjoining buckstay and within the outward extent of the buckstay, a fluid supply main connected therewith, a plurality of fluid nozzles spaced from each other along each fluid conductor and directed inwardly toward the door opening and upwardly, a fume hood positioned above the door opening, and suction-producing means connected therewith.

3,933,596
DESULFURIZATION OF COKE

Raymond H. Long, Morristown, and Morgan C. Sze, Upper Montclair, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Apr. 1, 1974, Ser. No. 457,118
Int. Cl.² C10B *57/00*
U.S. Cl. 201—17 **13 Claims**



1. A process for desulfurizing coke, comprising:

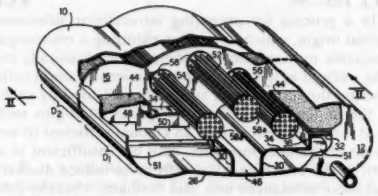
a. heating coke in admixture with a desulfurizing amount of sodium carbonate at a coke temperature of from about 1600°F. to about 2400°F. for a period of at least 0.5 hour to calcine the coke, and

b. thereafter contacting the coke from step (a) with a desulfurizing gas comprising a member selected from the group consisting of phosgene and a mixture of carbon monoxide and chlorine, said contacting being effected at a coke temperature from about 1200°F. to about 1800°F. to produce a coke with a sulfur content of no greater than 0.85 percent.

3,933,597
MULTISTAGE FLASH EVAPORATOR FOR PRODUCING SOFT WATER FROM A SALINE WATER

Diego Barba; Antonino Germana; Giuseppe Liuzzo; Giovanni Tagliaferri, and Giancarlo Spizzichino, all of Rome, Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Dec. 18, 1974, Ser. No. 533,805
Int. Cl.² B01D *3/02, 3/10*
U.S. Cl. 202—173 **9 Claims**



1. In a multistage flash-evaporator for producing soft water from a saline water comprising: a horizontal, uninterrupted rectilinear tubular shell having a pair of transverse end walls; a plurality of longitudinally spaced transverse partition walls in the shell subdividing the inside of the latter into a series of consecutive distilling units; a longitudinally extending hood in each unit subdividing the inside of the unit into an evaporation chamber and a condensation chamber, said longitudinally extending hood including a filtering zone pervious to steam through which the evaporation chamber communicates with its associated condensation chamber in the unit; normally submerged passageways in each partition wall allowing a continuous flow of saline water through the evaporation chambers in the consecutive units; and a condenser in each unit comprising a rectilinear bundle of heat exchange tubes extending longitudinally in the condensation chamber; the cross-sectional shape of both the said shell and chambers being constant throughout the length of the shell and symmetrical with respect to a vertical longitudinal mid-plane of the evaporator, and the condensers in the distillation units being serially connected therebetween; the improvement comprising:

a — the said shell forming a pair of lobes at opposite sides of said longitudinal mid-plane enclosing therebetween a spinal portion defined by an upwardly arched top wall and a downwardly arched bottom wall;

b — the cross-sectional shape of both said top wall and said bottom wall being a circular arc having its centre of curvature on the said mid-plane;

c — the cross-sectional shape of each of said lobes consisting of a continuous polycentric curve which is concave towards the spinal portion and is connected by its branches to the respective circular arcs mentioned at (a);

d — a pair of said longitudinally extending hoods provided in each distillation unit at opposite sides of said mid-plane, each of the hoods comprising a roof wall which includes the aforementioned filtering zone and is located in its corresponding lobe and in an adjacent part of the spinal portion of the shell, and a side wall connecting the roof wall to the bottom wall of the spinal portion in an arrangement wherein said side walls of the hoods form

therebetween a distillate-collecting channel extending longitudinally of the distilling unit between a pair of evaporating chambers underlying their respective hoods;

e — the said normally submerged passageways in each of the partition walls located in regions surrounded by the respective lobes of the shell.

3,933,598
COKE OVEN DOOR

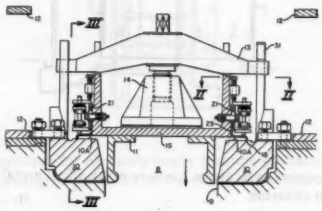
Erich E. Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed May 1, 1973, Ser. No. 356,086

Claims priority, application Germany, Feb. 23, 1973, 2309032

Int. Cl.² C10B *1/06, 25/06*

U.S. Cl. 202—248 **6 Claims**



1. A door structure in combination with a door frame surrounding an opening at an end of a longitudinally extending chamber of a coke oven, said door structure comprising:

a door forming an enclosure for the opening defined by said door frame;

a packing strip having an angular S-shape in respect to the transverse cross section thereof, said packing strip having one longitudinal edge arranged to extend along the peripheral surface of said door, said packing strip defining an extended edge resiliently arranged outwardly of the door for contact with said door frame,

clamp means at closely spaced-apart locations about the periphery of said door for clamping said packing strip onto the door, said clamp means being arranged to engage the S-shaped packing strip only at the inner edge from which said extended edge is resiliently-arranged outwardly thereof,

adjustable means carried by said door to position each of the clamp means and thereby adjust the extended edge surface of said packing strip relative to said door,

guide means secured to said clamp means and movable therewith when adjusting the extended edge of the packing strip relative to the door,

a push rod slideably supported by said guide means, and

a resilient member for urging said push rod into engagement with said packing strip with a sufficient force to urge the resilient extended edge for the packing strip into a sealing relation with said door frame when the door defines an enclosure for the opening to the chamber of the coke oven.

3,933,599
NITROSYL CHLORIDE AS A POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Dec. 9, 1974, Ser. No. 530,988

Int. Cl.² B01D *3/34*

U.S. Cl. 203—9 **8 Claims**

1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting such compound to distillation conditions in the presence of nitrosyl chloride (NOCl) as a polymerization inhibitor and in the substantial absence of oxygen.

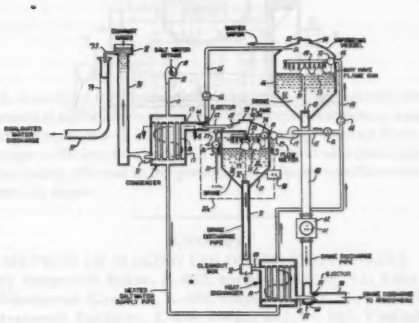
3,933,600
METHOD AND APPARATUS FOR DESALINIZATION OF WATER

Adiel Y. Dodge, deceased, late of Oakland, Calif., by Dorian Dodge Crocker, executrix, San Francisco, Calif., assignors to Dorian Dodge Crocker; Sherwood Dodge, Jr.; Dorian Dodge Robinson and Crocker Nat'l Bank in trust for Dariel Dodge & Betty Dodge Malone, all of, Calif.

Filed May 17, 1974, Ser. No. 471,120

Int. Cl.² F24H *1/20;* **B01D** *1/16, 1/14, 3/34, 3/00*

U.S. Cl. 203—10 **8 Claims**



1. Process of desalinizing water which comprises the steps of:

injecting saline water as a spray substantially free of solid particles into a closed vaporization zone;

burning fuel within the zone to form a flame positioned to directly contact the injected water to thereby vaporize a part of the water while collecting in the lower part of said zone a remainder of unvaporized water having a higher salt content than the injected water;

ejecting from the zone a mixture of water vapor and gaseous combustion products;

condensing water from the withdrawn mixture; and

ejecting the remainder having increased salt content from the zone;

injecting saline water as a spray into a second vaporization zone at a temperature above 130° F., the second zone being maintained at subatmospheric pressure, and thereby vaporizing a part of the water while collecting a residue of unvaporized water having increased salt content as a pool in the lower part of the second zone;

discharging the residue from the second zone downwardly through a column of water to produce at the bottom of said column a pressure greater than than the pressure within the second zone and controlling the discharge so as to maintain said pool within the second zone;

withdrawing vaporized water from the second zone;

maintaining the first-mentioned zone at a superatmospheric pressure; and

raising the pressure of vapor withdrawn from the second zone by eduction by using the mixture ejected from the first-mentioned zone as the driving gas.

3,933,601

ELECTROPLATING METHOD AND APPARATUS

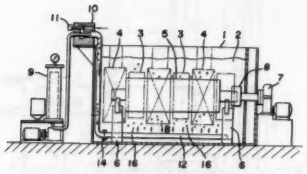
Motochika Ishibashi; Takahiko Inuzuka, and Tetsuo Maegawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1975, Ser. No. 558,137

Claims priority, application Japan, Mar. 13, 1974, 49-29306

Int. Cl.² C25D 7/04; C10G 17/06

U.S. Cl. 204—25 16 Claims



1. An electroplating method which comprises the steps of:

rotating a substrate submerged within an electrolytic solution and under the influence and application of ultrasonic waves;

entraining bubbles within a portion of said solution; and

causing said portion of said electrolytic solution to be ejected toward said substrate in a direction substantially opposite the direction of rotation of the substrate.

3,933,602

PALLADIUM ELECTROPLATING BATH, PROCESS, AND PREPARATION

Rene Henzi; Andre Meyer, both of Geneva, Switzerland, and Pierre Lalanne, Gex, France, assignors to Oxy Metal Industries Corporation, Detroit, Mich.

Filed Apr. 19, 1974, Ser. No. 462,484

Claims priority, application Switzerland, Apr. 27, 1973, 6142/73

Int. Cl.² C25D 3/50, 3/52, 3/56

U.S. Cl. 204—44 7 Claims

1. An aqueous electroplating bath suitable for obtaining deposits of palladium and its alloys wherein the palladium present consists essentially of a dissolved palladium complex of the formula $Pd(SO_3)(NH_3)_3$ in an amount from 1 g/l to 50 g/l of palladium, said bath exhibiting a pH of from 7 to 12.

2. The bath of claim 1 containing an atomic ratio of halide to palladium not in excess of 10.

3. The bath of claim 2 additionally comprising, in electrodepositable form, at least 1 mg/l of at least one metal selected from the group consisting of Cd, Cr, Co, Cu, Ga, Au, In, Fe, Pb, Mo, Ni, Ag, Sn, Zn, As, Sb, Bi, Pt, Rh, Ru, Ir and Os.

3,933,603

ELECTROLYSIS OF ALKALI METAL CHLORIDE

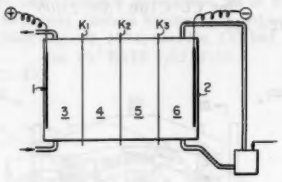
Yoshio Ishida, Asahi; Hiroshi Ono, and Reiji Takemura, both of Miyazaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 23, 1974, Ser. No. 463,366

Claims priority, application Japan, Apr. 25, 1973, 48-46107; Dec. 28, 1973, 48-1247

Int. Cl.² C25B 1/16, 1/26

U.S. Cl. 204—98 8 Claims



4. A process as in claim 1 wherein the alkali metal chloride is sodium chloride.

3,933,604

METHOD OF ELECTROLYTICALLY EXTRACTING GALLIUM FROM ALUMINATE SOLUTIONS

Colin George Honey, Hazlemore, and Stanley Leonard Jones, Gerrards Cross, both of England, assignors to The British Aluminium Company Limited, London, England

Filed July 19, 1974, Ser. No. 490,034

Claims priority, application United Kingdom, July 19, 1973, 34480/73

Int. Cl.² C25C 1/22

U.S. Cl. 204—123 10 Claims

1. A method of extracting gallium from aluminate liquor obtained in the course of the recovery of aluminate from aluminate ores which comprises electrolysing the liquor with a current density of at least 0.002 A/cm² and a cathodic potential relative to a saturated calomel electrode of at least 1.5 volts, using an anode made from a metal which does not produce undesirable impurities in the aluminate liquor under the conditions of electrolysis and a solid cathode made of a metal into which gallium diffuses, while maintaining the temperature of the aluminate solution in the range 25°to 80°C until the gallium has diffused into the cathode to give a gallium content in the surface layers of at least 0.10%.

3,933,605

NON-POLLUTING PICKLING METHOD

Thomas J. Butler, Monroeville; Robert M. Hudson, Churchill, and Clair J. Warning, Plum, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 415,084, Nov. 12, 1973, abandoned. This application June 20, 1974, Ser. No. 481,011

Int. Cl.² B01D 13/02

U.S. Cl. 204—151 8 Claims

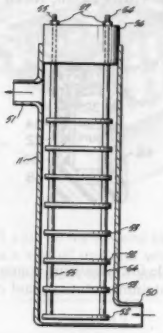
1. Method of pickling steel comprising contacting the steel with a pickling solution consisting of fluoboric acid, subjecting the spent fluoboric acid to electrodialysis by introducing the spent acid into the cathode compartment of a cell having said cathode compartment separated from an anode compartment by anion exchange membrane, recovering the iron on the cathode thereof and recycling the acid from the anolyte.

3,933,606

WATER TREATMENT PROCESS AND APPARATUS

Harry Keith Harms, Woodland Hills, Calif., assignor to Saul Gealer, Los Angeles, Calif.

Filed Dec. 3, 1973, Ser. No. 421,225
Int. Cl.² C02B 1/82
U.S. Cl. 204—152 15 Claims



1. A process for electrolytically treating contaminated water containing suspended and dissolved impurities comprising the steps of:

passing the contaminated water vertically upward through an upright column having a water inlet port adjacent the lower end thereof and a water outlet port adjacent the upper end thereof, wherein between the inlet and outlet port, a plurality of electrically conductive perforate plates are disposed in the column in a plane essentially perpendicular to the longitudinal axis thereof and electrically insulated therefrom, the transverse dimensions of the plate approximating those of the column so that essentially all of the contaminated water being passed through the column passes through perforations in the plates;

generating variable pulsating electrical signals of opposite signs; and,

supplying a variable pulsating electrical signal of a first sign to individual ones of a first set of the plates while simultaneously supplying a variable pulsating electrical signal of the opposite sign to individual ones of a second, alternating set of the plates to create a pulsating electrical field between the plates.

3,933,607

SENSITIZED VAPOR PHASE PHOTO-GRAFTING OF MONOMERS ONTO SURFACES

Howard L. Needles, and Rita P. Seiber, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 22, 1973, Ser. No. 390,574
Int. Cl.² C08F 8/00; C08L 1/12
U.S. Cl. 204—159.15 11 Claims

1. A vapor phase method for forming a graft copolymer in the presence of low energy irradiation comprising the steps of depositing a wetting agent onto the surface of a polyamide polymeric substrate; and contacting said substrate with an unhalogenated vinyl monomer from a vapor source, said monomer including substituted groups selected from the group consisting of organic acids and their derivatives, organic and inorganic esters and ethers and cyanide in the presence of light energy, the majority of which comprises photons having wavelengths over 3000 S., and contacting said wetted substrate with a volatile photosensitive compound from a vapor source, said photosensitive compound being capable of activation by exposure to said light to a state sufficient to create grafting sites on said polymeric substrate to there by graft polymerize said monomer at said sites, said wetting agent having an affinity for said polymeric substrate, monomer and photosensitive compound.

3,933,608

METHOD FOR THE DECOMPOSITION OF HYDROGEN SULFIDE

Larry A. Haas, Burnsville; Sanaa E. Khalafalla, Minneapolis, and Carl F. Anderson, Roseville, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 27, 1974, Ser. No. 501,002
Int. Cl.² C01B 17/02; B01K 1/00
U.S. Cl. 204—164 8 Claims

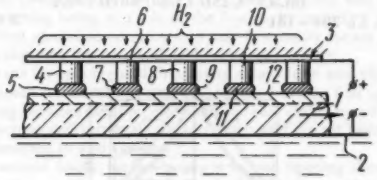
1. A method for the decomposition of hydrogen sulfide into elemental sulfur and hydrogen which comprises exposing a gas comprising H_2S to a silent electrical discharge derived from a voltage sufficient to effect said decomposition said decomposition being effected in the presence of polychlorotrifluoroethylene oil vapor.

3,933,609

METHOD OF MAKING COLOURED PHOTOMASKS

Jury Sergeevich Bokov, K-482, korpus 338a, kv. 61; Valery Nikolaevich Gurzheev, K-498, korpus 406, kv. 56; Vladimir Ivanovich Zakharov, K-498, korpus 440, kv. 188; Vladimir Sergeevich Korsakov, K-482, korpus 350, kv. 24; Vadim Petrovich Lavrischev, K-460, ploschad Junosti, 4, kv. 22; Alla Grigorievna Goron, K-498, korpus 440, kv. 231, all of Moscow; Mark Leonovich Glikman, ulitsa Kommunarnaya, 11, kv. 45, Saratov; Nikolai Nikolaevich Semenov, ulita Zagorodnaya, 15, Kv. 56, Saratov, and Viktor Yakovlevich Matvienko, ulitsa Tupikovaya, 1, Saratov, all of U.S.S.R.

Filed June 25, 1974, Ser. No. 482,841
Int. Cl.² B01K 5/00; C03C 17/00
U.S. Cl. 204—180 R 2 Claims



1. A method of making colored photomasks, consisting in doping a first surface of a flat glass substrate with a staining metal, selected from the group, consisting of copper, gold, silver and indium, moving a second surface of said glass substrate over an electrically conducting melt, said doping being effected by virtue of an electric diffusion of the ions of said staining metal occurring from the melt of lead with said staining metal, followed by reduction of said staining metal and by subsequent doping of said first surface of mentioned glass substrate by way of a repeated electric diffusion of the ions of said staining metal occurring from the melt of said staining metal with the metal selected from the group, consisting of

lead, tin, bismuth and thallium, followed by reduction of said staining metal, forming a protective layer on the stained layer of said glass substrate, corresponding to a predetermined pattern, and removing the unprotected portions of said stained layer and elimination of said protective layer, said photomasks having a substantially high optical density and minimum stained layer thickness, said photomasks having substantially large effective area.

3,933,610

DESALINATION PROCESS BY IMPROVED MULTISTAGE ELECTRODIALYSIS

Leo Ehara, Yokosuka; Takafumi Miwa, Saitama, and Masami Kamaya, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 14, 1975, Ser. No. 558,378

Claims priority, application Japan, Mar. 30, 1974, 49-35867

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 P **15 Claims**

1. An electrodialysis process for the desalination of aqueous salt solutions in which two or more stages for electrodialysis are connected in series to effect dilution by reduction of total ion content in progressive stages, each stage having multiple pairs of anionic and cationic membranes alternately placed therein to divide said stage into alternate dilution and concentration chambers containing dilution and concentration streams, said salt solution containing at least one divalent anion and at least one divalent cation capable of forming an insoluble salt in said concentration stream which comprises selectively retaining at least one of said divalent cations or anions in the dilution stream by conducting electrodialysis through an ion exchange membrane which forms one boundary of said dilution chamber and has a divalent ion permselectivity coefficient which is sufficiently less than one so that the concentration ratio of said selectively retained divalent cation or anion to monovalent ion of the same charge in the dilution chamber is increased and the concentration product of divalent cations and anions which are capable of forming said insoluble salt in the concentration chamber does not exceed the solubility product of the insoluble salt.

3,933,611

APPARATUS AND METHOD FOR CONTINUOUS ELECTROCOATING

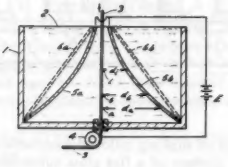
Michael Alan Dudley, Beaconsfield, Canada, assignor to Canada Wire and Cable Limited, Toronto, Canada

Filed Nov. 14, 1974, Ser. No. 523,920

Claims priority, application Canada, May 3, 1974, 198850

Int. Cl.² C25D *13/00;* **B01D** *13/02*

U.S. Cl. 204—181 **8 Claims**



1. An apparatus for continuously electrocoating a conducting substrate with essentially non-conductive material, comprising: means for continuously passing said substrate through an electrocoating bath; and at least one electrode facing at least a portion of the substrate, said electrode converging towards the substrate in the direction of travel of the substrate so that the rate of deposition of the coating material onto the substrate remains substantially constant throughout the electrocoating operation.

3,933,612

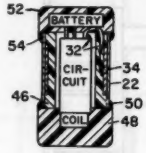
GLASS ELECTRODE STRUCTURE FOR RADIO CAPSULE

David J. Fischer, Corning, N.Y.; Hans J. Kunz, and Thomas E. Norby, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 158,293, June 30, 1971, abandoned. This application May 13, 1974, Ser. No. 469,079

Int. Cl.² G01N *27/36;* **A61B** *5/04*

U.S. Cl. 204—195 G **13 Claims**



1. In a radio capsule for measuring concentration of an ionic species in an ion containing solution, said capsule being of the type comprising

a housing,

an electrode structure for providing a voltage dependent on the activity of said ionic species in said solution, said electrode structure being so disposed in said housing that a portion thereof is adapted to be exposed to said solution,

an oscillator circuit for generating an rf signal which is modulated by the voltage provided by said electrode structure,

means for providing an operating voltage for said oscillator circuit, and

means for providing a reference potential for said electrode structure,

said electrode structure being characterized in that it comprises

a cylindrically shaped membrane of glass sensitive to said ionic species, said membrane having inner and outer surfaces, said outer surface of said membrane being adapted to be exposed to said solution,

a thin film conductive electrode disposed on at least a portion of the inner surface of said membrane,

conductive means for connecting said conductive electrode to said oscillator circuit, and

a mass of non-conductive backing material adherent to the inner surface of said conductive electrode and to that portion of the inner surface of said membrane adjacent to said conductive electrode, the thermal coefficient of expansion of said backing material being greater than that of said glass membrane and said glass membrane being in a state of compression.

3,933,613

ELECTRODE FIXTURE FOR PLATING BATH

Dennis Robert Turner, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

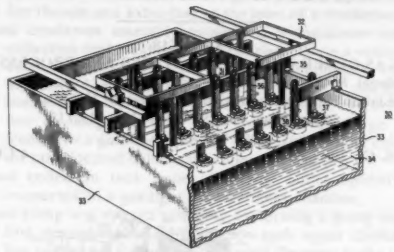
Filed Dec. 27, 1974, Ser. No. 536,736

Int. Cl.² C25D *17/10, 17/00*

U.S. Cl. 204—242 **5 Claims**

1. A cell for electroplating metals on a surface having an anode assembly and cathode assembly in which the anode assembly comprises an anode rod, an anode hook attached to the anode rod, means for attaching the anode hook to the anode rod, a consumable anode, and means for attaching the consumable anode to the anode hook, characterized in that the anode rod and anode hook are made of a flat stock material which consists essentially of titanium and the anode rod has a width between 1 and 3 inches and a thickness between one-eighth and 1 inch; and the anode hook has a width be-

tween 1 and 3 inches and a thickness between one-eighth and 1 inch and has an L shape with the short dimension of the L shape between 1 and 3 inches and the long dimension of the

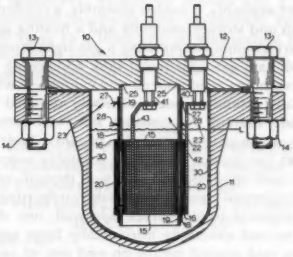


L shape between 3 and 12 inches and in which the long part of the L shape has a slot of uniform width slanting inwardly and upwardly for attachment to the anode rod.

3,933,614
PRESSURE VESSEL FOR HYDROGEN GENERATOR

Julian W. Bunn, Jr., Raleigh, N.C., assignor to Trienco, Inc., Raleigh, N.C.

Filed July 7, 1975, Ser. No. 593,751
Int. Cl.² C25B *1/02, 1/04, 1/10*
U.S. Cl. 204—266 **4 Claims**



1. In an electrolytic hydrogen or oxygen generator apparatus of the type having a pressure tank adapted to contain an electrolytic solution including water and an electrolyte, and having a water inlet, an oxygen outlet and a hydrogen outlet, the improved pressure tank assembly comprising, in combination:

a. a metal tank member having a closed bottom and an open top;

b. a cover member hermetically secured to the open top of said tank member, said cover member providing openings for said water inlet, oxygen outlet and hydrogen outlet;

c. a thin-wall integral cylindrical tube member having electrically insulating surfaces and positioned centrally inside of said tank member, the upper end portion of said tube member being connected to said cover member in a gas-tight seal and having a lower open end portion terminating immediately above the closed bottom surface of said tank member and including openings cut therein;

d. a woven, cylindrical asbestos curtain covering said tube openings and adapted to act as an impervious barrier to hydrogen and oxygen gas flow while allowing the passage of ions and electrolytic solution therethrough;

e. oxygen electrode means mounted inside said tank member and having electrically conducting means extending through said cover, said oxygen electrode means comprising a fine mesh screen electrode wrapped in close spaced relation around said asbestos curtain and covering said tube openings;

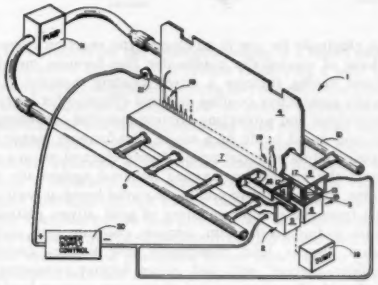
f. hydrogen electrode means mounted inside said tank member and having electrically conducting means extending through said cover, said hydrogen electrode means comprising a fine mesh screen electrode positioned inside of said tube and being coaxial with said tube in a close spaced relation therewith and having a height sufficient to cover said tube openings; and

g. an electrically insulating coating impervious to and inert with respect to hydrogen, oxygen, and sodium hydroxide applied to the entire interior side and bottom wall surfaces of said tank member.

3,933,615
FLUID FLOW STRIPPING AND PLATING SYSTEM

Elliott R. Levenson, Mission Viejo, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 9, 1969, Ser. No. 831,325
Int. Cl.² C25B *9/00*
U.S. Cl. 204—275 **6 Claims**



1. A fluid flow stripping and plating system for removable circuit boards and having a fluid source containing a fluid therein, comprising in combination:

Electrical contact means for connection to a removable circuit board having terminal contacts adapted to be energized with a voltage of one polarity;

First cavity means having a first opening therein said first opening being in a side of the first cavity means;

A first electrode connected to said first cavity means and extending the length of said first cavity means;

Means for spacing said first cavity means from said circuit board for permitting said fluid to flow from the first opening between said first electrode and said circuit board and across said terminal contacts when said circuit board is inserted in said system;

A second cavity means having a second opening therein, said second opening being in a side of said second cavity means and having a length of at least equal to that of said first cavity means;

A second electrode connected to said second cavity means and extending the length of said second cavity means;

said first and second electrodes being adapted to be energized with a voltage of the opposite polarity; and

A second means for spacing said second cavity means from said circuit board for permitting said fluid to flow from the second opening between said second electrode and said circuit board and across said terminal contacts when said circuit board is interposed between said first and second electrodes, said first and second electrodes being composed of carbon.

3,933,616

COATING OF PROTECTED ELECTROCATALYTIC MATERIAL ON AN ELECTRODE

Henri Bernard Beer, Kalmthout, Belgium, assignor to Chemnor Corporation, Panama City, Panama

Continuation of Ser. No. 144,907, May 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 702,695, Feb. 2, 1968, Pat. No. 3,632,498. This application Sept. 24, 1973, Ser. No. 400,120

Claims priority, application United Kingdom, Feb. 10, 1967, 6490/67

Int. Cl.[2] C25B *11/08, 11/10*

U.S. Cl. 204—290 F 3 Claims

1. An electrode for use in an electrolytic reaction comprising a base of electrically conductive film-forming metal in solid form having thereon a mixed coating material of an electrically conductive coating material effective for carrying out electrolysis and protecting coating material consisting of at least one metal oxide of a single film-forming metal, the protecting coating material acting during electrolysis in a cell to protect the conductive coating material against the cell conditions, the conductive coating material being at least one material from the group consisting of gold, silver, platinum, palladium, iridium, ruthenium, osmium, rhodium, iron, nickel, chromium, copper, lead, manganese, and nitrides, carbides and sulfides thereof, and said group further consisting of oxides of gold, silver, iron, nickel, chromium, copper, lead and manganese.

3,933,617

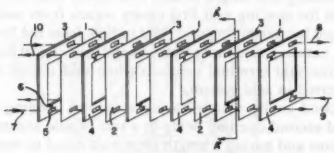
ELECTRODIALYSIS APPARATUS

Tosinori Yamamoto; Takeo Utunomiya, both of Chiba, and Sigeharu Otuka, Tokyo, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,678

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—301 7 Claims



1. A filter-press type electrodialysis apparatus comprising:

a plurality of alternately arranged anion exchange membranes and cation membranes having cell frames interposed between said membranes, said membranes and frames being arranged and fastened between a pair of electrodes;

said cell frames include a central opening, conduits for feeding or discharging the liquid to be electrodialyzed to or from said cell frames, and passages connecting said conduits to said central openings; and

wherein the portion of said frame defining said passages comprise inserts formed separately from the body of said cell frame and which are of a rigid material having a thickness less than the thickness of said cell frame body which is made of an elastic material.

3,933,618

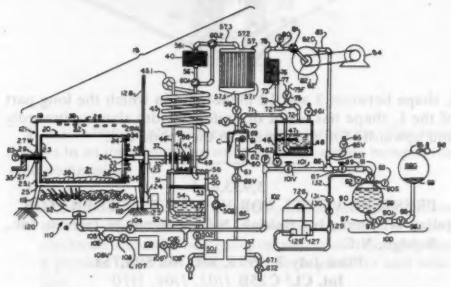
GAS GENERATION APPARATUSES AND PROCESSES

Colonel E. Patton, Farmington, N. Mex., assignor to Blue Ember Flame Corporation, Farmington, N. Mex.

Filed Mar. 11, 1974, Ser. No. 449,715

Int. Cl.[2] C10G *1/00*

U.S. Cl. 208—8 4 Claims



1. Apparatus for generating combustible gas mixtures and liquid gasoline from coal comprising, in operative combination, a retort assembly, a washer assembly, a condenser assembly, a pump and storage assembly and a heating assembly;

said retort assembly comprising a gas-tight retort tank and a hood, said gas-tight retort tank comprising a horizontally extending rigid imperforate cylindrical wall and one vertically extending side wall firmly attached thereto on one side thereof and another side wall removably yet firmly attached to another side of said cylindrical wall, a support for journal means for rotatably supporting said retort tank near said one side wall thereof, another support for journal means for rotatably supporting said retort tank adjacent to said other side wall; one shaft means fixed to and extending horizontally from said one side wall to said journal means on said one of said supports and rotatably supported thereon, and another shaft means fixed to and extending from the other of said side walls to the journal means on said other support and rotatably supported thereon, a retort discharge channel extending through said removably attached side wall and shaft connected thereto, and one end of a cooling coil operatively connected to said retort discharge channel; a grid support, a grid thereon, said grid below said retort tank, a gas burner being located below said grid, and the hood of said retort tank comprises a lower base and an upper perforated shell, said lower base being a rigid frame open at its top and bottom, said frame surrounding the periphery of the retort tank and, on removal of said removably attached side wall from said horizontally extending cylindrical wall, said rigid imperforate cylindrical wall of said retort tank and one vertical side wall being pivotal about a horizontal axis on said one support and said horizontally extending imperforate cylindrical wall being tiltable to a sloped position whereby to empty the content of said retort tank on to said grid,

said washer assembly comprising a cooling coil and a washer tank, said cooling coil comprising a vertically extending coil, one, lower, end of said cooling coil operatively attached to said retort discharge channel, the other, discharge, end of said cooling coil operatively attached to said washer tank and extending thereinto, said washer tank comprising a vertically elongated gastight tank with

top, bottom and side walls joined together and enclosing a gas-tight chamber therebetween, said discharge end of the cooling coil extending towards the bottom wall thereof, said washer tank having an upper outlet line operatively connected to the top thereof and to the chamber therein and extending to the inlet of a condenser;

said condenser assembly comprising a condenser and a collection tank, said condenser connected via a vertically extending tube therebelow to said collection tank, which has an upper discharge outlet and a lower discharge outlet, said lower discharge outlet connected to a collection discharge line and said collection discharge line feeding to a gasoline collector tank, said gasoline collector tank located below said collection tank;

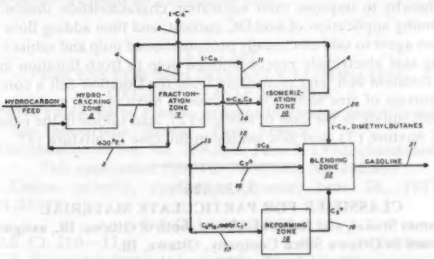
said collection tank upper discharge outlet operatively connected to a gas-tight gas treatment chamber,

said pump and storage assembly comprising a pump and a first storage tank, said collection tank upper discharge line connected via said gas treatment chamber to the inlet of said pump, a power means operatively attached to said pump, and a discharge outlet on said pump, a pump discharge line operatively connected to said pump discharge outlet, a first tee connected to said pump discharge line, one arm of said tee connected to said first storage tank through a first throttle valve and another arm of said tee operatively connected to the inlet of a second throttle valve, said second throttle valve having an outlet, said second throttle valve outlet connected to said burner below said retort tank by a line, and comprising also a second tee in said line from said first tee to said burner between said burner and said second throttle valve, two arms of which tee are connected to said line and a reserve gas storage compartment having a cut-off valve operatively connected thereto and a gas storage compartment discharge line operatively connects said cut-off valve to a third arm of said second tee whereby said burner is operatively connected to said reserve gas storage compartment.

3,933,619
GASOLINE PRODUCTION PROCESS

Robert H. Kozlowski, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 12, 1973, Ser. No. 405,993
Int. Cl.² C10G 37/10
U.S. Cl. 208—60 **5 Claims**



1. A process for producing high octane low lead content or unleaded gasoline from a hydrocarbon feedstock which comprises

hydrocracking the hydrocarbon feedstock, thereby obtaining a hydrocracking effluent comprising singly branched hexanes and C_7+ hydrocarbons;

fractionating the hydrocracking effluent in a fractionation zone, thereby obtaining a stream rich in singly branched hexanes;

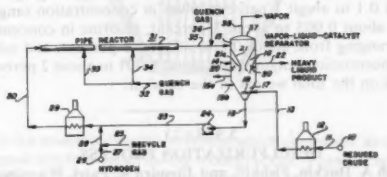
isomerizing the singly branched hexanes to doubly branched hexanes in an isomerization zone operated at a reaction temperature below 300°F.; and

combining the doubly branched hexanes with C_7+ hydrocarbons derived from the hydrocracking effluent, thereby obtaining a high octane gasoline or gasoline blending stock.

3,933,620
PROCESS FOR HYDROPROCESSING HEAVY HYDROCARBON FEEDSTOCKS IN A PIPE REACTOR

Leonard W. Russum, Highland, Ind., and Gerald B. Hoekstra, South Holland, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 16, 1973, Ser. No. 388,802
Int. Cl.² C10G 13/00
U.S. Cl. 208—108 **6 Claims**



1. A process for the hydroprocessing of a heavy petroleum hydrocarbon fraction in a system employing a pipe reactor, which process comprises: heating said hydrocarbon fraction to a temperature of at least 600°F. to obtain a preheated heavy hydrocarbon fraction; introducing said preheated heavy hydrocarbon fraction into the bottom zone of a vapor-liquid-catalyst separator having three zones, a top zone wherein vapor is separated from liquid and catalyst, said vapor, said liquid, and said catalyst having been introduced into said top zone as effluent from said pipe reactor, an intermediate zone wherein said catalyst separates from said liquid, and a bottom zone wherein said preheated heavy hydrocarbon fraction is introduced into said bottom zone and mixed with said catalyst to form a heavy-hydrocarbon-catalyst slurry; withdrawing said heavy-hydrocarbon-catalyst slurry from the bottom of said bottom zone; heating said heavy-hydrocarbon-catalyst slurry to a temperature of at least 700°F. to obtain a heated heavy-hydrocarbon-catalyst slurry; passing said heated heavy-hydrocarbon-catalyst slurry through said pipe reactor in the presence of hydrogen under conditions suitable for the hydroprocessing of heavy petroleum hydrocarbons, including a temperature of about 600° to about 1,000°F. and a hydrogen partial pressure of about 300 psia to about 3,000 psia, while controlling the temperature in said pipe reactor by a means for temperature control; withdrawing effluent from said pipe reactor and passing said effluent into said top zone of said vapor-liquid-catalyst separator; withdrawing vapor product from said top zone of said vapor-liquid-catalyst separator; withdrawing liquid product from said intermediate zone; and obtaining usable products from said vapor product and said liquid product, said catalyst being suitable for the hydroprocessing of heavy petroleum hydrocarbons.

3,933,621
CATALYTIC CRACKING PROCESS USING STEAMED COGELLED SILICA ALUMINA CATALYST

Robert J. White, Pinole; Donald A. Hickson, Irvine, and Charles E. Rudy, Jr., El Cerrito, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 24, 1972, Ser. No. 300,081
Int. Cl.² C10G 11/04
U.S. Cl. 208—120 **5 Claims**

1. A process for catalytic cracking of a hydrocarbon feedstock which comprises contacting the feedstock with a catalyst which consists essentially of a simultaneously cogelled synthetic silica-alumina containing 56 to 90 weight percent

alumina, said catalyst having been steamed at about 1,400°F, and said process producing relatively high yields of C_3 and C_4 olefins.

3,933,622

TRIMETALLIC HYDROCARBON CONVERSION CATALYST

Howard Lee Mitchell, III, and James Richard Hays, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 4, 1973, Ser. No. 421,515

Int. Cl.² C10G *35/08;* **B01J** *27/06, 23/68*

U.S. Cl. 208—139 **29 Claims**

10. A reforming catalyst consisting essentially of a composite of alumina, platinum in concentration ranging from about 0.1 to about 1 percent, rhenium in concentration ranging from about 0.1 to about 1 percent, silver in concentration ranging from about 0.005 to about 5 percent, chlorine in concentration ranging from about 0.3 to about 1.5 percent, and sulfur in concentration ranging from about 0.001 to about 2 percent, based on the total weight of the catalyst.

3,933,623

DESULFURIZATION PROCESS

Joseph A. Durkin, Fishkill, and Jitendra A. Patel, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 9, 1974, Ser. No. 495,968

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **12 Claims**

1. A process for the hydrodesulfurization of a petroleum oil fraction having an initial boiling point of at least about 500°F. which comprises contacting said fraction in the presence of added hydrogen under hydrodesulfurization conditions including a temperature between about 750° and 850°F. and a space velocity between about 3 and 10 v/v/hr. with a catalyst comprising an iron group metal, oxide or sulfide and a Group VI metal, oxide or sulfide supported on a base comprising a refractory inorganic oxide support selected from the group consisting of alumina, magnesia and zirconia and mixtures thereof and containing between 0 and 5 weight percent silica, said catalyst also containing from 0.1 to 5 percent noble metal by weight based on the catalyst composite.

3,933,624

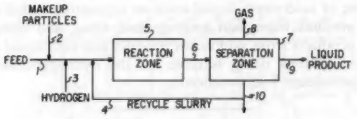
SLURRY SYSTEM FOR REMOVAL OF CONTAMINANT FROM SYNTHETIC OIL

Gary A. Myers, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 23, 1974, Ser. No. 435,637

Int. Cl.² C10G *17/00*

U.S. Cl. 208—253 **15 Claims**



1. A method of removing a nonmetallic contaminant comprising at least one of arsenic and selenium in elemental or combined form from a synthetic hydrocarbonaceous fluid obtained from normally solid coal, oil shale or tar comprising mixing said hydrocarbonaceous fluid with (1) particles of a material selected from the group consisting of iron, cobalt, nickel, at least one oxide of said metals, at least one sulfide of said metals and a combination thereof; said particles being of a size sufficient to form a slurry with said hydrocarbonaceous fluid, and (2) hydrogen; heating at an elevated pressure said slurry and hydrogen mixture in a reaction zone to a temperature sufficient to effect in conjunction with said elevated pressure removal of said contaminant from said hydrocarbonaceous fluid and deposition of said contaminant on said particles; said temperature being less than that which substantially alters the character of said hydrocarbonaceous fluid; and recovering a liquid product stream comprising said hydrocarbonaceous fluid essentially free of said contaminant from the thus treated slurry.

3,933,625

ELECTRICAL PRECONDITIONING IN A SELECTIVE FLOTATION OF SULFIDE ORES

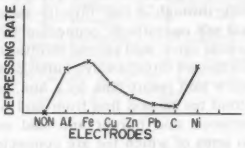
Ikuo Nagano, Hino, and Kozo Saitoh, Tokyo, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 431,926

Claims priority, application Japan, Nov. 14, 1973, 48-127188

Int. Cl.² B03B *1/00*

U.S. Cl. 209—9 **8 Claims**



1. A method of ore separation which comprises: electrically preconditioning an ore pulp containing mixed metal sulfide ore particles selected from the group consisting of (1) mixtures of zinc sulfide and iron sulfide, (2) mixtures of molybdenum sulfide and copper sulfide, (3) mixtures of lead sulfide and copper sulfide, and (4) mixtures of lead sulfide and zinc sulfide, by applying DC current to said ore pulp from electrodes inserted in said pulp, at a current density of from 0.002 to 20 A/dm² and at a voltage of from 0.5 to 750 V, for a period of time effective to depress the flotability of iron sulfide in the case of mixture (1), copper sulfide in the case of mixtures (2) and (3), and lead sulfide in the case of mixture (4) relative to the remaining metal sulfides in the respective mixtures whereby to improve their separation characteristics; discontinuing application of said DC current; and then adding flotation agent to said electrically preconditioned pulp and subjecting said electrically preconditioned pulp to froth flotation in a flotation cell, and recovering from the flotation cell a concentrate of zinc sulfide in the case of mixture (1), molybdenum sulfide in the case of mixture (2), lead sulfide in the case of mixture (3), and zinc sulfide in the case of mixture (4).

3,933,626

CLASSIFIER FOR PARTICULATE MATERIAL

James Stukel, and Robert G. Rentz, both of Ottawa, Ill., assignors to Ottawa Silica Company, Ottawa, Ill.

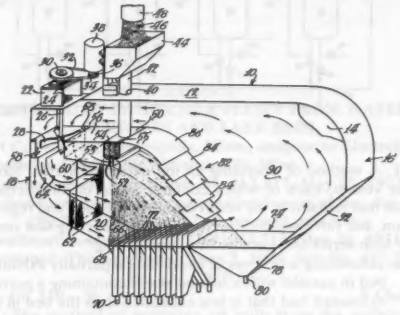
Filed July 12, 1973, Ser. No. 379,004

Int. Cl. B07b *4/02*

U.S. Cl. 209—134 **5 Claims**

3. Air classifying apparatus for particulate material comprising: a generally horizontally elongated, substantially closed housing having an upper side, a bottom side, a pair of side walls, and means defining end walls; means in said bottom wall intermediate the ends thereof defining a plurality of individual particle outlets, said outlets extending transversely of said housing and being arranged serially in the direction of elongation thereof; an air impelling device located within said housing adjacent one end thereof and operable to direct air from said one end toward the other end across said particle outlets; a particulate material inlet within said housing includ-

ing an elongated metering orifice within said housing extending transversely of said housing through which particulate material may be introduced into said housing, said orifice being located directly above or upstream of the particulate outlet nearest said housing one end so that particulate material flowing therefrom will be entrained in a current of air generated by said air impelling device with the heavier particles dropping more directly downwardly under the influence of gravity than the lighter particles; means downstream of said impeller and upstream of said orifice for establishing a laminar air flow characteristic in the current of air generated by said air impeller prior to the impingement of said current of air on a stream of particles emanating from said orifice; light particle



directing means within said housing for directing extremely light particles entrained in said current of air toward at least the particle outlet nearest the other end of said housing; and said housing including an enlarged chamber downstream of said particle outlet nearest said other end, said chamber being sufficiently large that a current of air passing therethrough is at a relatively low velocity to substantially preclude particles entrained in said current of air from passing through said chamber; means associated with said chamber for directing particles entrained in air reaching said chamber toward one of said particle outlets; and means associated with said chamber for redirecting air therefrom toward said air impelling device to define a closed air circulation path.

3,933,627

PROCESS FOR BIOLOGICALLY ELIMINATING ORGANIC WASTE MATTER

Pierre Fusey, Paris, France, assignor to Banque pour l'Expansion Industrielle "Banexi", Paris, France

Continuation of Ser. No. 259,850, June 5, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,897

Claims priority, application France, June 28, 1971, 71.23459

Int. Cl.[2] B01J *13/00*

U.S. Cl. 210—11 **3 Claims**

1. A process for the elimination of petroleum residues by biodegradation, comprising adding to 100 parts by weight of said residue, 70 to 200 parts by weight of a composition consisting essentially of 40 to 60% by weight of vinasse, a substantial amount up to 12% by weight of an ammonium compound selected from the group consisting of ammonium nitrate, ammonium sulphate and ammonium phosphate, 3 to 8% by weight of a phosphate selected from the group consisting of alkali phosphate and alkaline earth phosphate, 25 to 40% by weight of a carbonate selected from the group consisting of alkali carbonate and alkaline earth carbonate, and 1 to 3% by weight of glue, mixing said composition with 10 to 30 times its weight of water to form an emulsion, and aerating said emulsion.

3,933,628

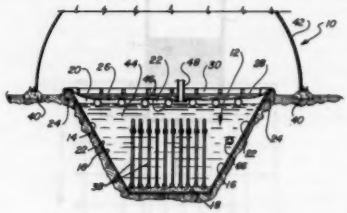
METHOD AND APPARATUS FOR THE ANAEROBIC DIGESTION OF DECOMPOSABLE ORGANIC MATERIALS

Frederick T. Varani, Golden, Colo., assignor to Bio-Gas of Colorado, Inc., Denver, Colo.

Filed July 10, 1974, Ser. No. 487,039

Int. Cl.[2] C02C *1/14;* **F24J** *3/02*

U.S. Cl. 210—12 **11 Claims**



1. An anaerobic digestion system which comprises: an open-topped reaction vessel having biodegradable organic reactants therein; a liquid and gas impervious lid sealing the reactants therein; a liquid heat exchange medium covering the lid and cooperating therewith to define a pond; means insulating said pond from the reactants so as to minimize the direct exchange of heat therebetween; translucent roof-forming means covering said pond effective to transmit solar energy to the heat exchange medium contained therein; means associated with said bond for withdrawing the heat exchange medium therefrom and adjusting the temperature thereof to a predetermined level; and, heat transfer means connected to take the heat exchange medium with its temperature thus adjusted and circulate same in heat exchange relation through the reactants to maintain the temperature thereof at a relatively constant level effective to promote fermentation.

7. The method of anaerobically digesting decomposable organic material which comprises: introducing bio-degradable organic reactants into an open-topped reaction vessel, covering said reaction vessel with a fluid-filled pond exposed to the sun so as to produce a sealed chamber therein, insulating said pond from the reactants so as to minimize the direct exchange of heat from the sun-warmed liquid to said reactants, fermenting the reactants within said sealed chamber so as to generate a gas therefrom, removing the sun-warmed liquid from the pond and adjusting the temperature thereof, passing the liquid with its temperature thus adjusted in heat-exchange relation to the fermenting reactants in a manner to maintain same at a near constant pre-selected temperature effective to promote anaerobic digestion, and removing the gas thus generated.

3,933,629

FILTRATION

Kenneth Cecil Smith, Roydon, England, assignor to BOC International Limited, London, England

Filed June 14, 1974, Ser. No. 479,514

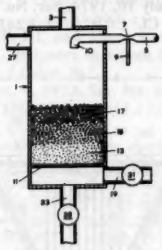
Claims priority, application United Kingdom, June 14, 1973, 28327/73

Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—17 **7 Claims**

1. A process for filtering an aqueous effluent material by introducing the effluent above a graded density filter bed wherein said bed includes layers of particulate material in which the smallest particles are of the most dense material and are at the lowest level and the largest particles are the least dense material and are at the uppermost level, and passing the same downward through the filter bed in which micro-organisms are supported wherein the micro-organisms are supplied with oxygen by substantially dissolving substantially pure oxygen gas in water to form oxygenated water and passing the

thus oxygenated water downwardly through the filter bed whereby the bio-availability of oxygen to the organisms is inhanced without significant disturbance of the graded density



of the filter bed thereby promoting the biological activity of the micro-organisms, and removing accumulated waste material from the filter bed by back flushing with attendant establishment of the graded density of the filter bed.

3,933,630

PURIFICATION OF WASTE WATER CONTAINING PHTHALIC ESTERS

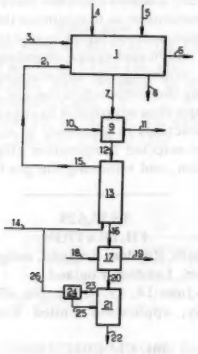
Jacques Helgorsky, Fretillon, and Michel Auroy, Chauny, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed Sept. 3, 1974, Ser. No. 502,899

Claims priority, application France, Sept. 12, 1973, 73.32732

Int. Cl.² B01D *11/00*

U.S. Cl. 210—21 **11 Claims**



1. A process for the purification of waste water resulting from the production of phthalic esters by esterification of phthalic acid or anhydride with alcohols having more than 4 carbon atoms, which comprises acidifying the waste water with a strong acid to attain a free acidity of the waste water greater than 0.05 N and extracting the acidified water with an alcohol having more than 4 carbon atoms for removal of organic impurities from the acidified water.

3,933,631

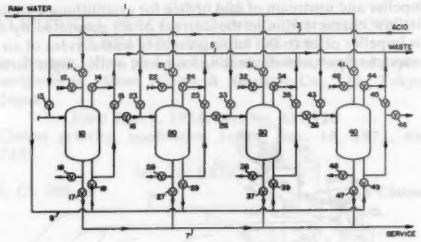
METHOD OF OPERATING ION EXCHANGE SYSTEM

Ralph C. Adams, Midland Park, N.J., assignor to The Permutit Company, Inc., Paramus, N.J.

Filed May 6, 1974, Ser. No. 467,135

Int. Cl.² B01D *15/06*

U.S. Cl. 210—34 **3 Claims**



1. A method of operating an ion exchange system having four vessels, each of which contains a bed of ion exchange resin that remains in the vessel during exhaustion and regeneration, and valve and conduit means for connecting said vessels for both series and parallel flow, comprising:

a. connecting a first vessel containing a partially exhausted bed in parallel with a second vessel containing a partially exhausted bed that is less exhausted than the bed in said first vessel to form a first service group, passing fluid to be treated in parallel through said first and second vessels and, at the same time, passing regenerant through a third vessel containing a partially regenerated bed and then through a fourth vessel containing an exhausted bed until the bed in said third vessel is regenerated and the bed in said fourth vessel is partially regenerated;

b. connecting said third vessel in series with said first vessel, with said third vessel downstream from said first vessel and said first and third vessels in parallel with said second vessel, to form a second service group, and passing the fluid to be treated through said second service group until the bed in said first vessel is exhausted;

c. removing said first vessel from service, connecting said second and said third vessel in parallel to form a third service group, passing the fluid to be treated in parallel through said second and third vessels and, at the same time, passing regenerant through said fourth vessel and then through said first vessel until the bed in the fourth vessel is regenerated and the bed in the first vessel is partially regenerated;

d. connecting said fourth vessel in series with said second vessel, with said fourth vessel downstream from said second vessel and the fourth and second vessels in parallel with the third vessel, to form a fourth service group, and passing the fluid to be treated through the fourth service group until the bed in the second vessel is exhausted;

e. removing said second vessel from service, connecting said third and fourth vessels in parallel to form a fifth service group, passing the fluid being treated in parallel through said third and fourth vessels and, at the same time, passing regenerant through said first vessel and then through said second vessel until the bed in said first vessel is regenerated and the bed in said second vessel is partially regenerated;

f. connecting said first vessel in series with said third vessel, with said first vessel downstream from said third vessel and the third and first vessels in parallel with the fourth vessel, to form a sixth service group, and passing the fluid to be treated through this service group until the bed in said third vessel is exhausted;

g. removing said third vessel from service, connecting said fourth vessel and said first vessel in parallel to form a seventh service group, passing the fluid to be treated in parallel through said fourth and first vessels and, at the same time, passing regenerant through said second vessel and then through said third vessel until the bed in the second vessel is regenerated and the bed in the third vessel is partially regenerated;

h. connecting said second vessel in series with the fourth vessel, with the second vessel downstream from the fourth vessel and the fourth and second vessels in parallel with said first vessel, to form an eighth service group, and passing the fluid being treated through said service group until the bed in the fourth vessel is exhausted; and

i. repeating the foregoing sequence.

3,933,632

REMOVAL OF IMMISCIBLE FLUIDS FROM WATER SURFACES AND LAKE BEDS

Earl C. Peterson, Minneapolis, Minn., assignor to Electrolysis Pollution Control Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 362,317, May 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 296,789, Oct. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 143,713, May 26, 1971, abandoned. This application June 7, 1974, Ser. No. 477,276

Int. Cl.² C02B *9/02*

U.S. Cl. 210—36 **5 Claims**

1. The method of removing oil spills from the surface of bodies of water comprising:

a. placing an adsorbant compound on the water surface and in direct contact with said immiscible fluid and maintaining contact between said immiscible fluid and said adsorbant compound until said immiscible fluid is adsorbed by said adsorbant compound; and

b. thereafter removing said adsorbant compound and adsorbed material from said water surface;

c. said adsorbant compound conssiting of an admixture of from between about 30% and 70% by weight of particulate lead slag mineral wool, balance of from between about 70% and 30% rock flour, said lead slag mineral wool having a film of an oil soluble hydrophobic film thereon, said rock flour being selected from the group consisting of trap rock, basalt and gabbro, and having a particle size of up to about 50 mesh.

3,933,633

METHOD FOR SEPARATING VINYL CHLORIDE

Kozo Saitoh, Tokyo, and Sumio Izumi, Kokubunji, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed May 14, 1974, Ser. No. 469,922

Claims priority, application Japan, Dec. 15, 1973, 48-140909

Int. Cl.² C02B *1/18*

U.S. Cl. 210—44 **6 Claims**

1. A method for separating vinyl chloride from a mixture of vinyl chloride with other non-plastic substances selected from the group consisting of soil, sand, metals, glass, rubber and a mixture thereof, which comprises introducing gas bubbles into a dispersion of the vinyl chloride mixture in an aqueous liquid medium, and adding to said dispersion a flotation agent selected from the group consisting of pine oil, kerosene, cresylic acid, eucalyptus oil, camphor oil, a higher alcohol, methyl isobutyl carbinol, pyridine, o-toluidine and a mixture thereof thereby to float the vinyl chloride due to the adherence of the gas bubbles thereto.

3,933,634

METHOD OF TREATMENT OF SLUDGES WITH SIZE-ADJUSTED CARBON

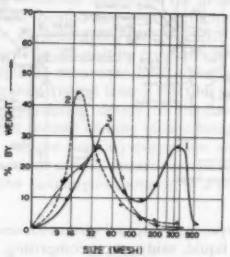
Toru Seki, No. 558, Kami-kizaki, Urawa, Saitama, Japan

Filed Aug. 9, 1972, Ser. No. 279,267

Claims priority, application Japan, Aug. 13, 1971, 46-60968; Aug. 13, 1971, 46-60969

Int. Cl.² C02B *1/20*

U.S. Cl. 210—46 **6 Claims**



5. A process for concentrating and separating solids from solid/liquid mixtures in the treatment of sewage sludge which comprises incorporating into such sludge 2 to 10% by weight of fine dust coal or lignite particles having a size distribution such that 30 to 50% by weight of the whole particles have a finer size not greater than 100 mesh and 70 to 50% by weight of the whole particles have a coarser size exceeding 100 mesh; wherein the size distribution of the particles is such as to correspond with the size distribution curve (**1**) of FIG. **1** of the drawings, mixing the sewage sludge and fine dust coal or lignite particles under agitation, incorporating into this mixture a coagulant comprising a mixture of iron and aluminum salts in an amount of from 1/50 to 1/10 by weight of the fine dust coal or lignite particles when 5 to 20 minutes have passed since the addition of said fine dust coal or lignite particles, allowing the resultant mixture to stand still for 20 minutes to 2 hours to separate it into a supernatant liquor and a coal-containing concentrated sludge, feeding the coal-containing concentrated sludge onto a continuously moving filter cloth disposed so that it crosses at a predetermined inclined angle, the surface of the coal-containing concentrated sludge, thereby to form on the filter cloth at first a precoat layer of coarser particles of the fine dust coal or lignite and then a layer of coagulates composed of finer particles of the fine dust coal or lignite and sludge solid, and conducting vacuum suction filtration from the back surface of the filter cloth thereby to remove water from said layer.

3,933,635

METHOD FOR REMOVING SOLUBLE SELENIUM FROM ACIDIC WASTE WATER

Wayne N. Marchant, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 15, 1975, Ser. No. 596,117

Int. Cl.² C02C *5/02*

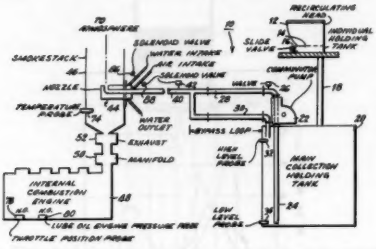
U.S. Cl. 210—50 **4 Claims**

1. A method for removing selenium from zinc smelter effluent comprising reacting the effluent with a metallic reducing agent at a temperature of about 25° to 85° C for a time sufficient to reduce a substantial portion of the soluble selenium to insoluble metallic selenium.

3,933,636
APPARATUS AND METHOD FOR DISPOSING OF SOLID HUMAN EXCREMENT IN AN ENGINE-DRIVEN CONVEYANCE

Robert A. Daniels, 520 E. 72nd St., New York, N.Y. 10021

Filed Mar. 28, 1975, Ser. No. 563,157
Int. Cl.² B01D 21/24; F01N 3/02
U.S. Cl. 210—71 13 Claims



1. On a conveyance, a disposal system for sewage including solid waste and liquid, said system comprising:

a. a recirculation toilet bowl employing a reusable chemical flushing liquid and having an individual holding tank in which solid waste is substantially separated from liquid and said waste and liquid are accumulated, said bowl having means for discharging said individual holding tank after several flushes,

b. a main collection holding tank,

c. means for leading the discharge from the individual holding tank to the main collection holding tank,

d. a comminutor pump, said pump having

i. an outlet and

ii. an inlet,

e. means connecting the inlet to adjacent the bottom of the main collection holding tank,

f. means connecting the outlet to the main collection holding tank so that when the pump is in operation a closed cycle is provided for withdrawing liquid and solid waste from the main collection holding tank, macerating it in the pump and returning it to the main collection holding tank whereby after a length of time the material in the main collection holding tank will assume a geltinous consistency,

g. an internal combustion engine furnishing a source of power for propelling the conveyance, said engine having an exhaust through which exhaust gases from the engine are discharged,

h. an exhaust-gas conduit to receive exhaust gases discharged from the engine and to eject them into the atmosphere,

j. a nozzle in the exhaust gas conduit,

k. a bleed-off conduit leading from the comminutor discharge to the nozzle,

m. a valve in said conduit,

n. means for energizing said pump while said valve is closed so as to convert the liquid and waste in the main collection holding tank to a gelatinous consistency,

o. means for opening the valve after said material is reduced to a gelatinous consistency and for discharging said material through the bleed-off conduit and out of the nozzle,

p. means for injecting air under pressure into the material leaving the nozzle so as to atomize the same,

q. said pump-actuating means being under the regulation of the following triggering conditions:

i. the temperature of exhaust gases in the exhaust gas conduit,

ii. the level of material in the main collection holding tank, and

iii. the condition of the engine

iv. such that the comminutor pump is not actuated unless the temperature of the exhaust gases in the stack is at least 600°F, the level of the material in the main collection holding tank is at least at a predetermined high elevation, and the engine is running, is not idling and is operating under conditions sufficient to engender a volume of exhaust gases that will substantially fully evaporate, incinerate and combust the vaporized gelatinous material in the smoke stack with the aid of the injected air,

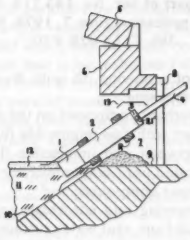
r. said valve in the bleed-off conduit being closed during operation of the comminutor pump, and

s. time delay means for opening the valve after a period of time sufficient to reduce the material in the main collection holding tank to a gelatinous consistency while the said triggering conditions still prevail.

3,933,637
FLUID HANDLING AND SEPARATING

Jan-Erik Ostberg, Torps Sateri, 640 33 Bettna, Sweden

Continuation-in-part of Ser. No. 286,831, Sept. 6, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,736
Int. Cl.² B01D 21/26; C21B 3/04, 7/14
U.S. Cl. 210—83 6 Claims



1. A method of separating a mixture of metal melt and slag which comprises introducing the mixture into the lower end of a hollow cylinder body mounted to rotate about a slanting axis, rotating the body about such axis at a sufficient speed to draw the mixture upwardly in the body to form the slag into a truncated paraboloid of revolution with its lower end surrounded by the melt to separate the melt from the slag, preventing upward movement of the melt in the cylinder body beyond a predetermined point by limiting the upward movement thereof and simultaneously permitting discharge of the melt downwardly, and preventing downward movement of the slag which has been separated from the melt, while permitting the escape of the slag at the upper end of said body.

3,933,638
LIQUID FUEL PURIFICATION SYSTEM

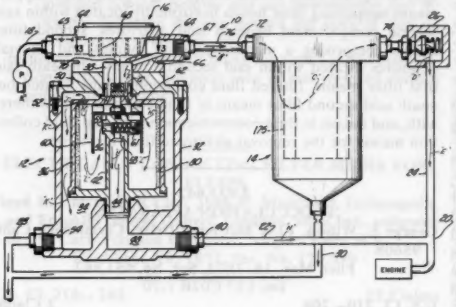
Walter F. Isley, Grosse Pointe, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed June 7, 1974, Ser. No. 477,538
Int. Cl.² B01D 33/40
U.S. Cl. 210—97 7 Claims

1. In a liquid fuel flow system wherein fuel flowing through said system under pressure between a source of fuel and a user of such fuel is freed from contaminants, the improvement which comprises the combination of

a. a centrifuge having an inlet port in liquid communication with said source, an outlet port in liquid communication with said user, and a rotatable cylindrical drum adapted to effect the packing of particulate matter against the inside wall thereof;

b. means for rotating said centrifuge;
c. a filter having an inlet port in liquid communication with said source, and an outlet port in liquid communication with said user; and
d. bypass means to effect the flow of fuel through either said centrifuge or said filter, said means comprising a first



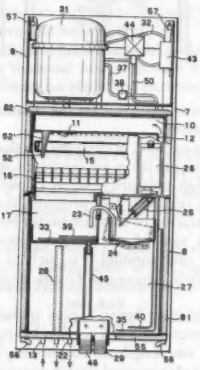
valve responsive to centrifugal force to effect the flow of fuel through said centrifuge and a second valve responsive to fuel pressure above a predetermined level for effecting the flow of fuel through said filter, and
e. wherein flow of fuel through said centrifuge reduces the pressure of said fuel below said predetermined pressure.

3,933,639

APPARATUS FOR PREPARING BEVERAGES

Livio Pollastri, and Franco Tessarolo, both of Pordenone, Italy, assignors to Industrie A. Zanussi S.p.A., Pordenone, Italy

Filed Feb. 15, 1974, Ser. No. 443,103
Claims priority, application Italy, Feb. 16, 1973, 20518/73
Int. Cl.[2] B01D *9/00, 3/42*
U.S. Cl. 210—149 **10 Claims**



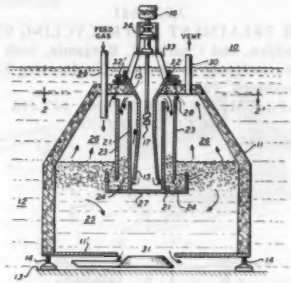
1. An automatic household type machine for preparing beverages, more particularly artificial mineral water, comprising water feeding means, a demineralizing device provided with means for the fractional crystallization of the fed-in water, a mineralizing device for introducing into the demineralized water the ions which are characteristic of the mineral water to be obtained, a tank for receiving and storing the mineralized water, controlled dispensing means for mineralized water in the tank and control means for automating the machine operation, the demineralizing device comprising a refrigeration circuit including a compressor, a principal evaporator which is U-shaped and arranged horizontally, said principal evaporator having a vertical cross-section in a vertically elongated tubular form which gradually tapers downwards, an auxiliary evaporator and a capillary tube with restrictor function, shower diffusion means formed by a boxlike container equipped at is bottom with a plurality of holes which are placed directly above the U-shaped principal evaporator to diffuse by dripping the fed-in water onto the outer surface of the principal evaporator, a tray located below the principal evaporator to collect the water dripping therefrom, circulating means for sending to the shower diffusion means at least a part of the water collected in the tray, first heating means associated with an upper portion of the principal evaporator to cause stripping of the ice formed on the principal evaporator and chute means located below the principal evaporator to collect the ice stripped from the principal evaporator and convey it towards an ice melting container in which at least a part of the capillary tube is housed, siphoning means being provided for transferring at least a fraction of the melted ice through the mineralizing device to the mineralized water storing tank and second heating means being housed in the tank together with the auxiliary evaporator and controlled by the control means so as to maintain the stored water, in combination with the auxiliary evaporator, at a pre-selected temperature.

3,933,640

METHODS AND APPARATUS FOR TREATING WASTEWATER

Bradley S. Kirk, North Plainfield, and Raymond M. Chappel, Mendham, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 413,409, Nov. 6, 1973. This application Sept. 20, 1974, Ser. No. 507,847
Int. Cl.[2] C02C *1/02;* **C02B** *3/08*
U.S. Cl. 210—197 **13 Claims**



1. Apparatus for oxygenating a body of wastewater containing organic solids comprising a generally enclosed oxygenating chamber having top, bottom and sidewalls and emplaceable in said body of wastewater and having an aperture defined in said bottom wall of said chamber; means for pumping wastewater under treatment into said chamber through an inlet thereof; means for creating a turbulent condition in said pumped wastewater in a mixing zone in said chamber and for contacting said turbulent wastewater with said oxygenating gas to thereby dissolve oxygen and entrain oxygenating gas in said turbulent wastewater; liquid accumulation means disposed within said chamber for receiving oxygenated wastewater from said mixing zone and for dissipating said turbulence to enable disentrainment and recovery within said chamber of undissolved oxygenating gas entrained in said wastewater in said mixing zone; and nozzle means for discharging said oxygenated wastewater into said body of wastewater at a velocity such that said body of wastewater is sufficiently stirred to maintain said organic solids suspended therein, the improvement comprising said nozzle means having a plate member

and a rim portion extending at a downward angle from the periphery of the plate member which has an area smaller than the area of said aperture and a geometry corresponding to the geometry of said aperture; and means for supporting said plate member and rim portion spaced away from said bottom wall at said aperture such that oxygenated wastewater is discharged from said chamber in a predetermined, multi-directional pattern into said body of wastewater.

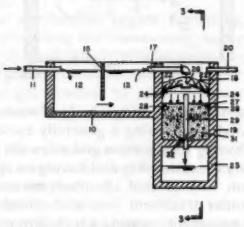
12. Apparatus for oxygenating a body of wastewater containing organic solids comprising a generally enclosed oxygenating chamber having top, bottom and sidewalls and emplaceable in said body of wastewater; means for pumping wastewater under treatment into said chamber; means for creating a turbulent condition in said pumped wastewater in a mixing zone in said chamber and for contacting said turbulent wastewater with said oxygenating gas to thereby dissolve oxygen and entrain oxygenating gas in said turbulent wastewater; liquid accumulation means disposed within said chamber for receiving oxygenated wastewater from said mixing zone and for dissipating said turbulence to enable disentrainment and recovery within said chamber of undissolved oxygenating gas entrained in said wastewater in said mixing zone; and nozzle means for discharging said oxygenated wastewater into said body of wastewater at a velocity such that said body of wastewater is sufficiently stirred to maintain said organic solids suspended therein, the improvement comprising said nozzle means including an aperture defined in the lower portion of at least one of said sidewalls; top and bottom plate members spaced apart from one another and disposed above and below said aperture, respectively, and extending from said sidewall into said body of wastewater; and adjustable cover means adapted to slidably engage said top plate member and extend downwardly therefrom such that the passage between said top and bottom plate members, through which passage said discharged oxygenated wastewater may flow, is controlled in dependence upon the vertical position of said adjustable cover means.

3,933,641

SEWAGE TREATMENT AND RECYCLING SYSTEM

Lyall C. Hadden, and Charles T. Benjamin, both of Honeybrook, Pa., assignors to Environs Engineering Enterprises, Inc., Honeybrook, Pa.

Filed Mar. 4, 1974, Ser. No. 447,496
Int. Cl.² B01D *35/00*
U.S. Cl. 210—205 **6 Claims**



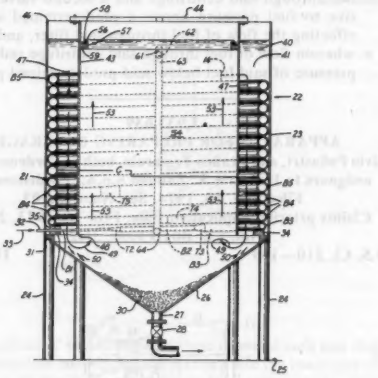
1. Sewage treatment apparatus comprising, in combination, a first container and a second container, inlet means in an upper portion of the sidewall of said first container, means for aerating liquid in said first container, outlet means in an upper portion of the sidewall of said first container oppositely spaced from said inlet, said outlet means comprising a conduit with a first open end located within said first container and a second open end located in and approximately centrally of said second container, fluid distributor structure comprising a trough with a bottom and sidewalls, said trough being located beneath said second open conduit end for the reception of fluid therefrom, downwardly sloping sidewalls peripherally arranged around said trough with the inner peripheral ends thereof in fluid communication with said trough whereby excess fluid received by said trough is caused to flow over the surfaces of said sloping sidewalls, apertures distributed in the surface of said sloping sidewalls with baffle structure adjacent thereto constructed and arranged to divert liquid into said apertures, first filter means comprising a perforated support means supporting filter media horizontally located within said second compartment beneath said apertures, second filter means comprising a mixture of sand, humus and alluvial deposites located within said second container beneath said first filter means, filtered fluid collection means located beneath said second filter means in fluid communication therewith, and means in fluid communication with said fluid collection means for the removal of filtered fluid therefrom.

3,933,642

FLOCCULATION APPARATUS

George E. Wilson, 1231 McClaren Drive, Carmichael, Calif. 95608

Filed Mar. 18, 1974, Ser. No. 451,862
Int. Cl.² C02B *1/20*
U.S. Cl. 210—206 **2 Claims**



1. A flocculation apparatus for the treatment of a fluid, said apparatus comprising:

a. a conductor capable of carrying the fluid and a coagulant mixed therewith from an upstream inlet end at a first relatively high pressure head to a downstream outlet end at a second relatively low pressure head, the dimensions and configuration of said conductor being predetermined so that the rate of energy dissipation at any location throughout said conductor is such as to effect flocculation of particle aggregates to any given size in the minimum time;
   1. said conductor being a pipe including a plurality of discrete sections, each section having a predetermined diameter and length, and a plurality of transition members of predetermined length connecting adjacent pipe sections, said discrete sections being of progressively larger diameters in a downstream direction;
   2. said pipe being helically wound into a coil of predetermined diameter;
b. a vertical, right circular cylindrical tank encompassing said coil;
c. an inverted conical closure depending from the lower end of said tank and forming the bottom of said tank;
d. a vertical, right circular cylindrical divider wall defining an interior compartment, said divider wall being coaxially disposed within said tank and forming an annular vertical passageway with the walls of said tank;

1. said pipe coil being supported on said tank and located within said annular passageway with the outlet end of said pipe discharging into said annular passageway, the bottom end of said annular passageway overlying said inverted conical bottom of said tank so that the heavier flocculation clusters in the treated fluid descend through said annular passageway into contact with said inverted conical bottom and are downwardly and inwardly deflected thereby toward the apex of said inverted conical bottom; and

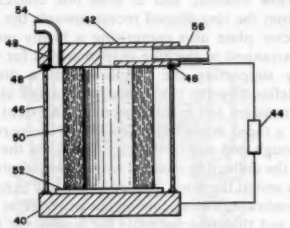
e. means for periodically draining the accumulated flocculation clusters from the apex area of said inverted conical bottom of said tank.

3,933,643

ELECTRICALLY CONDUCTING FILTER MEDIA FOR FLUIDS

Floyd E. Colvin, Tell City; John R. Mummert, Indianapolis, and Franklin George Gilbert, Lebanon, all of Ind., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Sept. 10, 1971, Ser. No. 179,399
Int. Cl.² B01D *35/06*
U.S. Cl. 210—243 **12 Claims**



1. A filter element, said filter element including:

a. a fluid permeable body composed of electrically conductive carbonaceous material disposed throughout said body for defining an electrical pathway therethrough;

b. an external terminal means; and

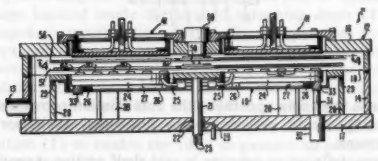
c. electrical conductive means in electrical contact with said carbonaceous material and with said external terminal means for defining an electrical pathway there between.

3,933,644

SPUTTER COATING APPARATUS HAVING IMPROVED TARGET ELECTRODE STRUCTURE

James R. Skinner, Cupertino, and Albert Lang, Jr., Palo Alto, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 237,566, March 23, 1972, abandoned, which is a continuation of Ser. No. 875,657, Nov. 12, 1969, abandoned. This application May 24, 1973, Ser. No. 363,449
Int. Cl.² C23c *15/00*
U.S. Cl. 204—298 **8 Claims**



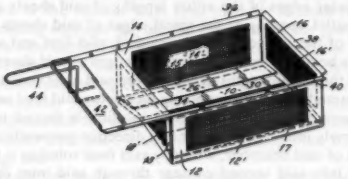
1. In a coating apparatus for sputtering material from a target electrode structure by a gaseous discharge for deposition onto a substrate surface, comprising a chamber defining a controlled environment for said sputtering and deposition, a target electrode structure having a surface within said chamber of the material to be sputtered, means within said chamber for supporting a substrate object at a location for deposition thereon of said material, and means for initiating and sustaining a gaseous discharge within said chamber to sputter said material from said target electrode structure for deposition onto said substrate object; THE IMPROVEMENT WHEREIN said target electrode structure comprises a metallic target electrode plate having an inner surface facing the interior of said chamber and an outer surface facing outwardly of said chamber, said chamber having a metallic wall portion adjacent said target electrode structure and having an aperture in said wall portion, a tubular dielectric member having one end hermetically sealed to said target electrode plate adjacent the periphery of said target electrode plate, the other end of said tubular dielectric member having a hermetic seal connection to said wall portion, said aperture being large enough to permit said target electrode plate and said tubular dielectric member to be inserted through the aperture from the outside of said chamber, and the inner surface of said target electrode plate being positioned inside said chamber whereby the inner surface of said target electrode plate can be covered with either dielectric or metallic sputter material, the inner surface of said target electrode plate extending into said chamber no further than to the position at which said inner surface of said target plate is substantially coplanar with the inner surface of said adjacent wall portion of said chamber, and said adjacent wall portion of said chamber being closely adjacent the periphery of said target electrode plate to prevent sputtering from the periphery of said target electrode plate.

3,933,645

DEEP FAT FRYER TRAP

John D. Keramidas, 1214 Fort St., Lincoln Park, Mich. 48146

Filed July 8, 1974, Ser. No. 486,524
Int. Cl.² B01D *23/26*
U.S. Cl. 210—305 **5 Claims**



1. A deep fat fryer trap having bottom, side and end walls connected to form a box-like structure, said bottom wall sloping upwardly from the opposite side wall to a ridge portion along the medial area thereby defining a pair of crumb traps along opposite sides of the ridge portion of the bottom wall, said bottom wall being imperforate except for the ridge portion, a crumb strainer screen disposed along said ridge portion, said side and end walls being largely open and having crumb strainer screens extending across the open areas thereof, baffle means extending over the pair of traps and spaced upwardly therefrom in substantially parallel relation with the bottom wall to isolate crumbs in the traps from cooking oil above the baffles, an apron connected to and extending laterally from the upper edge of one of the end walls, the upper edges of the remaining end and side walls flaring laterally outwardly to substantially meet the walls of a fryer well when the trap is placed therein, and a lifting handle connected to said apron and projecting outwardly there beyond.

3,933,646

REVERSE OSMOSIS SEPARATION APPARATUS

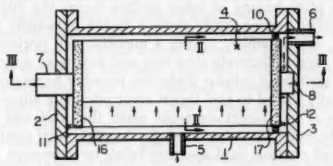
Naokatsu Kanamaru, Kyoto, and Hisaaki Fujino, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 9, 1974, Ser. No. 468,545

Claims priority, application Japan, May 14, 1973, 48-52573

Int. Cl.² B01D 31/00

U.S. Cl. 210—321 R 4 Claims



1. In a reverse osmosis separation apparatus comprising a cylindrical chamber having a membrane module disposed with the axis thereof coaxial to the axis of said chamber, said module comprising a hollow mandrel having at least one hole at the outer circumference thereof and at least one pair of membrane sheets spaced apart from each other by spacing layers and spirally wound about said mandrel to form a first spiral passage for a permeated solution between the opposite inner surfaces of said sheets and to form a second spiral passage for a feed solution between the opposite outer surfaces of said sheets, said first passage being closed at the outer edges of the entire lengths of said sheets and having an outlet opening elongated in the axial direction at the inner edges of the entire lengths of said sheets to communicate with with the interior of said mandrel through said hole thereof, means for supplying said feed solution into said chamber to allow the solution to flow into said second passage, means for discharging the nonpermeated solution which flows out of said membrane module from said chamber, and means for discharging said permeated solution which flows into the interior of said mandrel from said chamber, the improvement comprising: said second passage having an inlet opening elongated in the axial direction at the outer edges of the entire lengths of said sheets and an axiaal outlet opening at the spiral edges of said sheets in the vicinity of the surface of said mandrel; said first and second passages being closed at the opposite edges of said sheets over most of the spiral lengths except where said axial outlet opening is formed, and; said supplying means for said feed solution being provided so that said feed solution is forced to flow transversely into said chamber in a direction perpendicular to the axis of said chamber, whereby said feed solution is forced to flow into said second passage through said inlet opening thereof and to flow spirally around said mandrel through said second passage and said nonpermeated solution is forced to flow out of said membrane module through said axial outlet opening of said second passage, said permeated solution flowing spirally in said first spiral passage and being discharged via said hole in the mandrel into the interior of said mandrel.

3,933,647

APPARATUS FOR THE SEPARATION OF LIQUID MIXTURES BY MEANS OF PERMEABILITY SELECTIVE SEPARATION MEMBRANES

Fritz Müller, Avully, Switzerland, assignor to Louis Schleiffer AG, Feldbach, Switzerland

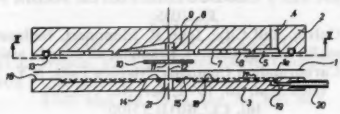
Filed June 17, 1974, Ser. No. 480,192

Claims priority, application Switzerland, June 19, 1973, 8849/73

Int. Cl.² B01D 31/00

U.S. Cl. 210—346 12 Claims

1. An apparatus for the separation of liquid mixtures by means of permselective separation membranes, comprising at least one separation module composed of a distributor plate, a collector plate and an intermediate situated separation membrane, said separation membrane having oppositely situated faces, one of said faces defining an effective membrane surface, the distributor plate being provided at the region of the effective membrane surface with at least one throughpassage opening arranged at the periphery thereof for the mixture to be separated and at least one open flow channel extending from said throughpassage opening towards the center of the membrane, said flow channel being arranged such that the mixture along one face of the membrane is subjected to a turbulent flow for the successive flushing of the membrane surface, said membrane being provided with an axial throughflow opening into which opens said flow channel, the collector plate comprising a body of imporous material formed with an axial bore, a substantially ring-shaped recess arranged oppo-



site the flow channel, and at least one collecting channel leading from the ring-shaped recess towards the outside, and the collector plate also comprising a highly porous carrier element arranged in the ring-shaped recess for substantially uniformly supporting the membrane at a discharge side thereof defined by the other face, the carrier element being pressure resistant and highly porous to an extent sufficient to allow for a rapid unhindered flow-off of the permeate which flows through and out of the membrane via the ring-shaped recess to the collecting channel without any appreciable pressure drop and at the same time opposing any bending-through of the membrane, and sealing means provided at the distributor plate and the collector plate for sealing the flow channel and the ring-shaped recess at the center and at the periphery of the membrane from one another and from the surroundings against high pressure and vacuum.

3,933,648

SCREENING APPARATUS

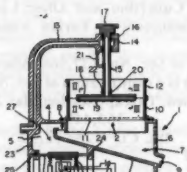
Kiyoshi Urayama, Kyoto, Japan, assignor to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Oct. 23, 1973, Ser. No. 408,750

Claims priority, application Japan, Oct. 25, 1972, 47-106995

Int. Cl.² B01D 35/20

U.S. Cl. 210—355 4 Claims



1. In a screening apparatus, the combination comprising:

housing means provided with horizontal shelf portion means;

means defining an opening in said shelf portion means;

open ended frame means disposed about said means defining an opening;

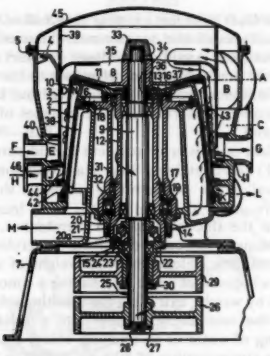
said frame means extending upwardly therefrom;

screen means disposed at the lower end of said frame means and adapted to cover said means defining the opening;
means for supplying liquid to said screen from a position above said screen means;
plate means disposed below said screen means and inclined relative to said screen means to provide a drainage conduit for said liquid; and
air pulsation means disposed below and protected by said plate means, said pulsation means communicating with said screen means by an outlet above said plate means but below said screen means.

3,933,649
APPARATUS FOR PURIFYING AND FRACTIONATING PARTICLE SUSPENSIONS

Sten Eskil Einarsson Ahlfors, Asgatan 65, 776 00 Hedemora, Sweden

Continuation of Ser. No. 225,487, Feb. 11, 1972, abandoned. This application June 20, 1974, Ser. No. 481,233
Claims priority, application Sweden, Mar. 31, 1971, 2528/71
Int. Cl.² B01D *21/26*
U.S. Cl. 210—378 **13 Claims**

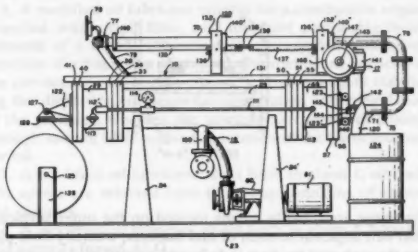


1. In an apparatus for purifying and fractionating a fiber suspension, said apparatus including an outer annular chamber (D) having an inlet (A) for the fiber suspension to be purified and fractioned, said chamber being radially outwardly defined by a stationary shell (3) and radially inwardly by a rotatable first screening drum (2) having a circular cross-section, said first drum being provided with pulsating means (43) and screen openings and an inner annular chamber (N) with an outlet (L) for impurities, the reject, the inner chamber being radially outwardly defined by said first screening drum (2) and radially inwardly by a second screening drum (1) for finely screening the fiber suspension, and further including a passage located inside the second screening drum (1) and arranged to receive the purified fiber suspension, i.e., the accept, and communicating with an outlet (M), therefor, the improvement wherein the pulsating means of said first screening drum (2) is fixed to said drum, and wherein said first screening drum is provided with openings which are considerably larger than are the screen openings in the second screening drum (1) to enable the fiber suspension to pass through the first drum (2), while separating from the suspension the coarser and heavier impurities thereof, to the second screening drum (1), and through passage through which the suspension is purified.

3,933,650
APPARATUS FOR FILTERING FLUIDS

Morgan Lentz, 60 Addison Ave., Rutherford, N.J. 07070

Continuation of Ser. No. 379,994, July 17, 1973. This application Jan. 13, 1975, Ser. No. 540,490
Int. Cl.² B01D *33/00*
U.S. Cl. 210—387 **7 Claims**



1. An apparatus for filtering fluids, which comprises:
a. a housing, comprising
1. a filter chamber including a first end wall having an opening, a second end wall having an opening, and a first enclosing side wall having a filtrate opening;
2. a first sealing chamber including the first end wall, a third end wall having an opening, and a second enclosing side wall; and
3. a second sealing chamber including the second end wall, a fourth end wall having an opening, and a third enclosing side wall;
b. a tubular fluid inlet member slidably movable through the openings in the end walls in the housing, which includes at a first end a first section, a second section, and a perforated medial section which is located intermediate the first section and second section;
c. tubular filter media extendable through the openings in the end walls in the housing;
d. means for displacing the tubular fluid inlet member and the tubular filter media so that during filtration the first end of the tubular fluid inlet member extends into the housing through the tubular filter media for positioning the first section in the first sealing chamber, the medial section in the filter chamber, and the second section in the second sealing chamber, and after filtration the length of tubular filter media in which the filtered solids are retained and the second section and medial section of the tubular fluid inlet member are displaced from the housing; and
e. means for sealing the filter chamber which cooperate with the first section and second section of the tubular fluid inlet member to seal the filter chamber.

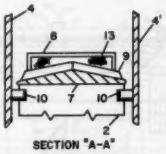
3,933,651
RECOVERING BITUMEN FROM LARGE WATER SURFACES

Harold L. Erskine, Devon, Pa., assignor to Great Canadian Oil Sands Limited, Toronto, Canada

Filed Oct. 7, 1974, Ser. No. 512,371
Int. Cl.² B01D *35/08*
U.S. Cl. 210—400 **1 Claim**

1. An endless belt apparatus for recovering thick, tarry, bituminous froth from the surface of a body of water and delivering said froth to a discharge area above said body of water, said apparatus comprising in combination a frame supporting at least two rollers constructed and arranged to support an endless belt in an inclined position from the surface of said body of water to discharge area above said body of water, said belt comprising a downwardly sloping outer surface extending from a longitudinal raised central portion of the belt to its periphery, a plurality of screen-bottom buckets

supported by said belt on the outer surface thereof along its peripheral length, said screen bottoms having a mesh size in the range of 3.0 to 30.0 millimeters to selectively retain said bituminous froth in said bucket, passing fluids through said screen bottoms while moving from said body of water to said



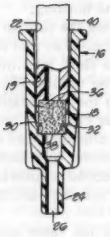
discharge area, baffle means located on the outer surface of said belt adjacent to each of said buckets, whereby fluid passing through said buckets is deflected toward said downwardly sloping surface of each side of said belt, and a means for rotating said belt.

3,933,652

PROCESS OF MANUFACTURING A POROUS, STAINLESS STEEL FILTER ELEMENT AND SEALING IT IN A TUBULAR FITTING, AND RESULTING FILTER

Theodore E. Weichselbaum, Normandy, and William W. Gusky, Florissant, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Apr. 25, 1973, Ser. No. 354,309
Int. Cl.[2] B01D *39/02*; **B22F** *3/16, 7/02*
U.S. Cl. 210—446 **22 Claims**



1. A process for manufacturing a sintered, porous stainless steel filter for use in medical injection and infusion equipment and the like; said filter being manufactured from stainless steel particles having an irregular or dendritic shape with arm-like projections extending outwardly therefrom; said process comprising the steps of:

screening dendritic stainless steel particles to obtain particles of a predetermined size;

mixing the screened particles with a lubricant;

loading the particle-lubricant mixture into a mold of desired shape;

compacting the particle-lubricant mixture in the mold at a predetermined compaction pressure to cause the arm-like projections on the particles to engage and interlock with one another and form a self-supporting, porous, green filter;

heating the green filter at a predetermined temperature to burn off the lubricant; and

sintering the filter to form a sintered, porous, stainless steel filter.

3,933,653

MEMBRANES OF ACRYLONITRILE POLYMERS FOR ULTRAFILTER AND METHOD FOR PRODUCING THE SAME

Yasuo Hashino, Matsudoshi; Masatsugu Yoshino; Hitoshi Sawabu, both of Tokyo, and Sukeo Kawashima, Osaka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1973, Ser. No. 354,786
Claims priority, application Japan, Apr. 28, 1972, 47-42751
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—500 M **6 Claims**

1. Membranes of acrylonitrile polymers for ultrafilter, comprising:

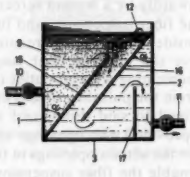
1. a porous layer or layers existing near and on at least one of the surfaces of said membranes, the average sizes of pores contained in said porous layer or layers and existing on each of assumptive parallel planes to the surfaces of said membranes, having a gradient in that said average sizes become smaller toward the surfaces of said membranes, and
2. a reticulate porous layer adjacent to said porous layer or layers (1) and containing therein a succession of voids of cylindrical shape or revolving ellipsoid shape having diameters of 5–50 μ and lengths of at least 10 μ and less than the thickness of said membranes, said membranes being prepared by dissolving an acrylonitrile polymer containing at least 84% by weight of acrylonitrile units in a solution of nitric acid having a concentration of 65–95% by weight, extruding the resulting solution, introducing the resulting extrudate into a solidifying bath consisting of water or an aqueous solution of nitric acid having a concentration of 30% by weight or less.

3,933,654

OIL SEPARATOR FOR SEPARATING OIL LIGHTER THAN THE PURIFIED LIQUID BEING IN A VERY PURE STATE

Cornelis Gerardus Middelbeek, Nootdorp, Netherlands, assignor to Frederic R. Harris (Holland) B.V., Netherlands

Filed June 19, 1973, Ser. No. 371,349
Claims priority, application Netherlands, June 21, 1972, 7208503
Int. Cl.[2] B01D *17/02*
U.S. Cl. 210—521 **10 Claims**



1. A device for separating oil from an oil laden liquid comprising:

a. a tank having oil laden liquid, side walls and a bottom with an inlet in a first side wall below the surface of said

oil laden liquid for introducing the oil laden liquid and an outlet in a second side wall for the purified liquid;

b. means for separating oil from an oil laden liquid comprising at least two parallel inclined plates spaced from each other in the tank;

c. one of the parallel plates extending at an incline from and having one edge fixed to the first side wall to define a space with said first side wall adjacent the inlet to minimize the turbulence of the incoming liquid;

d. the other parallel plate extending from and having one edge fixed to the second side wall to define a second space adjacent the outlet;

e. each plate having a free edge opposite its fixed edge, one free edge pointed upwardly and the other free edge pointed downwardly;

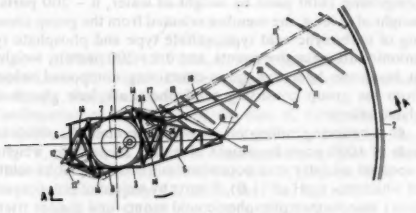
f. oil discharge means near the top of the tank for removal of the separated oil whereby oil laden liquid entering into said tank through the inlet has the turbulence thereof almost completely eliminated before entry into one end of said separating means wherein the oil is separated from the oil laden liquid so that the separated oil gathers near the top of the tank and is discharged therefrom through said discharge means and the purified liquid then flows from the other end of the separating means and is discharged through the outlet.

3,933,655

CABLE-CONTROLLED THICKENER

Anthony Grzina, Artarmon, Australia, and John Henry Ephraim Fedeler, Southbury, Conn., assignors to Warman Equipment International, Artarmon, Australia

Filed Mar. 12, 1974, Ser. No. 450,496
Int. Cl.² B01D *21/18*
U.S. Cl. 210—528 **7 Claims**



1. A cable-controlled thickener of the central column type having at least one cable supported rake arm with scraper blades attached thereto for shifting the contents in a settling tank on rotation of said rake arm around said central column, said thickener comprising a drive cage having at least one drag arm extending therefrom and being rotatably mounted on said column above the highest liquid level in said tank, driving means for said drive cage, a lower cage freely rotatably mounted below said drive cage above the highest liquid level in said tank in alignment with said drive cage, said lower cage near its lower end having hinge means to hinge at least one rake arm to said lower cage, said hinge means permitting movement of said rake arm only in a vertical plane, cable means connecting the drag arm of the drive cage with said rake arm; said cable means comprising a pair of support cables with the first ends of each fixedly connected to spaced apart points on the corresponding rake arm, a drag cable passing around a pulley located at the end of each drag arm opposite the drive cage and with its opposite ends connected to said support cable spaced apart points on the rake arm whereby, with changes in load on the rake arm and pivotal movement upward in a vertical plane relative rotational movement between the upper drive cage and freely rotatable lower cage maintains loading on the support cables and equalized pull on the drag cable.

3,933,656

LUBRICATING OIL WITH FLUOROCARBON ADDITIVE

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Continuation of Ser. No. 377,931, July 10, 1973. This application Jan. 16, 1975, Ser. No. 541,579
Int. Cl.² C10M *1/10, 3/02, 1/50, 7/02*
U.S. Cl. 252—25 **7 Claims**

1. A modified oil lubricant suitable for a combustion engine provided with an oil filter, said lubricant comprising major amounts of a liquid lubricating oil intermingled with minor amounts of a dispersion of polytetrafluoroethylene particles in the sub-micron range and a charge neutralizing agent stabilizing the dispersion to prevent agglomeration and coagulation of the particles, whereby the lubricant is capable of passing through said oil filter without separation of the particles from the oil.

2. A modified oil lubricant as set forth in claim 1, wherein said agents are selected from the group consisting of silanes and silizanes.

4. A modified oil lubricant as set forth in claim 1, wherein said agent is fumed Al_2O_3.

3,933,657

LUBRICANT WITH SYNERGISTIC EXTREME PRESSURE ADDITIVES

Leonard S. Seni; Arnold C. Witte, and Richard L. Coleman, all of Port Arthur, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,432
Int. Cl.² C10M *1/10, 3/02, 5/02, 7/02*
U.S. Cl. 252—29 **9 Claims**

1. A grease comprising

a. a major amount of a lubricating oil,

b. a thickener,

c. polyethylene of density ranging between 0.910 and 0.925 g/cc and

d. conventional extreme pressure agents.

2. A grease as in claim 1 wherein the conventional extreme pressure agents comprise molybdenum disulfide, lime, graphite and antimonydiamyldithiocarbamate.

3,933,658

METALWORKING ADDITIVE AND COMPOSITION

John P. G. Beiswanger, Easton, and Asadullah Nassry, Bethlehem, both of Pa., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 72,871, Sept. 16, 1970, abandoned. This application Nov. 29, 1974, Ser. No. 528,466
Int. Cl.² C10M *3/06, 1/44, 3/38, 5/24*
U.S. Cl. 252—31 **23 Claims**

1. An additive composition for imparting a combination of extreme pressure, antiwear and corrosion-inhibiting properties to a metalworking composition, said additive comprising:

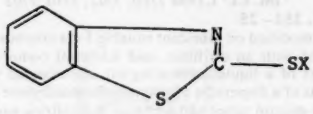
a. a phosphate ester having the following formula:

$$[RO-(EO)_a]_n-\overset{\overset{O}{\|}}{P}-[OX]_b$$

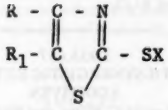
wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain alkyl groups having from 6 to 30 carbon atoms, phenyl, alkylphenyl, wherein the alkyl group has from 1 to 10 carbon atoms, and dialkyl phenyl wherein the alkyl groups have a total of from 2 to 20 carbon atoms; X is selected from hydrogen, ammonium, amines and metals from groups I-A, I-B, II-A and II-B of the periodic table; n is a number from 0 to 50; *a* is 1, 2 or 3, and *b* is 0, 1 or 2 with the proviso that said a plus said *b* equals 3; and

b. a sulphur-containing compound selected from the group consisting of elemental sulphur; sulphurized mineral oils; 2-mercaptobenzothiazole; 5-substituted, 6-substituted

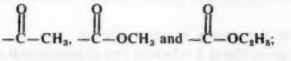
and 7-substituted 2-mercaptobenzothiazole wherein the substituent is selected from the group consisting of chloro, bromo, sulfonic acid, amido, methyl, carboxylic acid, and ethoxy; 2-mercaptobenzothiazole derivatives having the following formula:



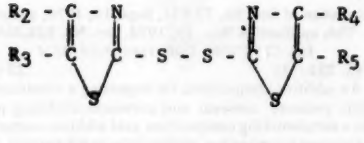
wherein X is selected from hydrogen, hydroxymethyl and metals of groups I-A, I-B, II-A and II-B of the periodic table; derivatives of 2-mercaptothiazole having the formula:



wherein X is selected from hydrogen, hydroxymethyl and metals from groups I-A, I-B, II-A and II-B of the periodic table; R is selected from hydrogen and an alkyl group having from 1 to 10 carbon atoms; and R_1 is selected from hydrogen, an alkyl group having from 1 to 10 carbon atoms, carboxy,



2,2′-dithiobisthiazole and derivatives thereof having the following formula:



wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen and an alkyl group having from 1 to 10 carbon atoms; 2,2′-dithiobis(benzothiazole) and 5,5′, 6,6′, and 7,7′ substituted derivatives thereof wherein the substituent is taken from a group consisting of dichloro, dibromo, disulfonic acid, diamido, dimethyl, dicarboxylic acid, and diethoxy; 2-mercaptonaphthiazole; 2,2′-dithiobis(naphthothiazole); diphenyl sulfide; diphenyl disulfide and di-tert-butyl sulfone, the weight ratio of said phosphate ester to said sulphur-containing compound being in a range of from about 25:1 to about 1:1 based on the weight of sulphur in said sulphur-containing compound, said additive composition containing at least about 0.005% sulphur by weight, based on the total weight of said additive composition.

3,933,659

EXTENDED LIFE FUNCTIONAL FLUID

Richard E. Lyle, El Cerrito, and Edward G. Foehr, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed July 11, 1974, Ser. No. 484,914
Int. Cl.² C10M 1/48, 3/42, 5/24
U.S. Cl. 252—32.7 E **10 Claims**

1. A lubricating oil composition comprising:
a. a major amount of an oil of lubricating viscosity, and
B. an effective amount of each of the following:
1. an alkenyl succinimide,
2. a Group II metal salt of a dihydrocarbyl dithiophosphoric acid,
3. a friction modifier selected from the group consisting of (a) fatty acid esters of polyhydric alcohols, (b) oil-soluble oxyalkylated derivatives of fatty acid esters of dihydric alcohols, (c) oil-soluble oxyalkylated derivatives of fatty acid esters of polyhydricalcohols, (d) fatty acid amides of low molecular weight amino acids, (e) N-fatty alkyl-N,N-diethanol amines, (f) N-fatty alkyl-N,N-di-(ethoxyethanol) amines, (g) N-fatty alkyl-N,N-di-poly(ethoxy)ethanol amines, and (h) mixtures thereof, and
4. a basic sulfurized alkaline earth metal alkyl phenate.

3,933,660

ROLLING OILS

Hachiro Tadenuma, Tokyo; Takashi Kato, Yokosuka; Ryoji Kaneda, Zushi; Fumio Ando, Yokosuka, and Makoto Yoshino, Yokohama, all of Japan, assignors to Toho Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1974, Ser. No. 497,042
Int. Cl.² C10M 1/44, 3/38, 5/24, 7/24
U.S. Cl. 252—32.5 **7 Claims**

1. A reducing hot rolling oil for copper and copper alloys comprising 1000 parts by weight of water, 6 – 200 parts by weight of at least one member selected from the group consisting of carboxylic acid type, sulfate type and phosphate type anionic surface active agents, and 0.8 – 200 parts by weight of at least one hydroxyl group-containing compound selected from the group consisting of alcohols, alkylene glycols and glycol ethers.

6. A reducing rolling oil according to claim 1, which consists of 1000 parts by weight of water, 20 parts by weight of rapeseed oil fatty acid potassium salt (a 1% aqueous solution of which has a pH of 11.0). 5 parts by weight of poly(oxyethylene) lauryl ether phosphoric acid mono- and diester triethanolamine salt (monoester ca. 60% diester ca. 40%, ethylene oxide addition mole number 2), 7 parts by weight of isopropyl alcohol and 3 parts by weight of ethylene glycol monobutyl ether.

3,933,661

AQUEOUS BASE POST PICKLING AND COLD ROLLING FLUID

Ellis Abrams, Harleysville, and Sidney Barber, Philadelphia, both of Pa., assignors to E. F. Houghton and Company, Philadelphia, Pa.

Filed Apr. 21, 1975, Ser. No. 569,662
Int. Cl.² C10M 1/40, 3/34, 5/22, 7/38
U.S. Cl. 252—32.5 **8 Claims**

1. A concentrate for addition to water to form an aqueous base lubricant composition particularly useful as a post pickle and rolling fluid for steel comprising (1) from about 50 to about 92 percent, by weight, of a water miscible fluid which is the condensation product of an aliphatic monocarboxylic acid containing from 10 to 20 carbon atoms, or glyceride thereof, and a dialkanolamine selected from the group consisting of diethanolamine and diisopropanolamine, the mole ratio of dialkanolamine to carboxylic acid being not less than about 1.5 to 1, and (2) from about 8 to about 50 percent of an agent for reducing the viscosity of aqueous base lubricant composi-

tions containing said concentrate, said viscosity reducing agent being selected from the group consisting of (a) a sulfonate of the general formula

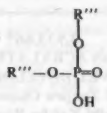
$$RSO_3X$$

in which R is an alkyl arylene group containing from 20 to 30 carbon atoms and X is Na, K, NH_4 or an amino group, (b) a mono alkyl ether of a lower alkylene glycol of the formula

$$R'O(CH_2CHO)_yOH$$
$$\quad\quad\quad R''$$

in which R′ is an alkyl group containing from 1 to 4 carbon atoms, R″ is H or CH_3, and y is an integer of from 1 to 3, (c) a glycol selected from the group consisting of dipropylene glycol, tripropylene glycol, 1,5-pentane diol, 2-ethyl-1,3-hexane diol, and hexylene glycol, and (d) a monohydroxy oxyethylene oxy 1,2-propylene aliphatic monoether in which the ethylene oxide and 1,2-propylene oxide are combined therein as oxyethylene and oxy 1,2-propylene groups, said monoether having an average molecular weight of at least 300, and mixtures of said viscosity reducing agents.

3. A concentrate according to claim 1 containing up to about 12 percent of a lubricity enhancing agent comprising a neutralized alkyl acid phosphate of the general formula



in which R‴ is an alkyl group containing from 10 to 12 carbon atoms.

3,933,662

LUBRICATING OIL COMPOSITIONS

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 413,144, Nov. 5, 1973, Pat. No. 3,856,687, which is a continuation of Ser. No. 142,838, May 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 45,567, June 11, 1970, Pat. No. 3,711,406. This application July 11, 1974, Ser. No. 485,470

Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*

U.S. Cl. 252—33.4 **4 Claims**

1. A lubricating oil composition comprising:

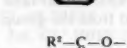
a major amount of a hydrocarbon oil of lubricating viscosity;

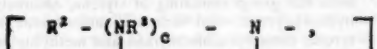
from about 0.01 to 5 weight percent of at least one oil-soluble acid neutralization accelerating compound of the formula

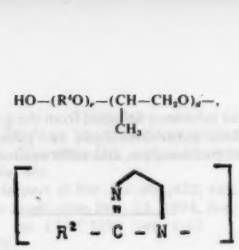
$$Y - (R^1O)_aH$$

wherein R^1 is an ethylene or propylene radical and a is in the range from 1 to about 12,

and wherein Y is selected from the group consisting of







wherein R^2 is an aliphatic hydrocarbyl radical of molecular weight in the range from about 100 to about 2,000, R^4 is an ethylene radical, *d* is in the range from 0 to about 70 and *e* is in the range from 1 to about 12, and sufficient alkaline earth metal carbonate dispersed in said hydrocarbon oil to provide an alkalinity value of from 0.5 to 100 mg.KOH/g.

3,933,663

TERTIARY DIAMIDE AS SWELLING AGENT FOR ELASTOMERIC SEAL

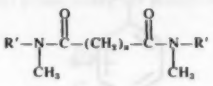
Robert M. Thompson, Wilmington, Del., and Francois E. Didot, Chadds Ford, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 293,984, Oct. 2, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,390

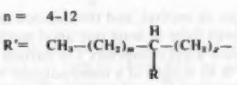
Int. Cl.² C10M *1/36, 3/30*

U.S. Cl. 252—51.5 A **8 Claims**

6. A power transmitting and lubricating liquid comprising about 0.5 -20 volume percent of at least one tertiary diamide having the following formula:



wherein



wherein

R = H, alkyl radical having C_1–C_5

m = 2–8

x = 1–5

said diamide imparting to the liquid the property of swelling seals and thereby preventing leakage.

3,933,664

ORGANIC PHOTOCONDUCTIVE TONER MATERIALS

Shinichiro Nagashima, and Kaichi Tsuchiya, both of Tokyo, Japan, assignors to Canon Inc., Tokyo, Japan

Division of Ser. No. 314,519, Dec. 13, 1972, Pat. No. 3,852,208, which is a division of Ser. No. 888,886, Dec. 29, 1969, Pat. No. 3,721,554. This application Nov. 6, 1974, Ser. No. 521,372

Claims priority, application Japan, Dec. 30, 1968, 43-96404; May 12, 1969, 44-36431. The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.² G03G *9/00, 9/02*

U.S. Cl. 252—62.1 **3 Claims**

3. In a toner for developing an electrostatic latent image, the improvement which comprises that the effective component of the toner is the reaction product obtained by condensing

a. an organic photoconductive compound selected from the group consisting of oxydiazole compounds, oxazole compounds, thiazole compounds, imidazole compounds, carbazole compounds and polycarbazole compounds; and

b. a colored substance selected from the group consisting of azomethine pyrazolone dyes, azo pyrazolone dyes, azo dyes, azomethine dyes and anthraquinone dyes.

3,933,665

MANUFACTURE OF AN ELECTROSTATIC TONER MATERIAL

Jozef Leonard Van Engeland, St. Katelijne-Waver; Noel Jozef De Volder, Edegem, and Daniel Maurice Timmerman, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation-in-part of Ser. No. 162,303, July 13, 1971, abandoned. This application Jan. 18, 1974, Ser. No. 434,686

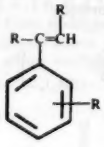
Claims priority, application United Kingdom, June 8, 1971, 61855/71

Int. Cl.² G03G 9/00

U.S. Cl. 252—62.1 P **8 Claims**

1. A particulate composition of matter adapted for developing electrostatic images consisting essentially of finely divided particles comprising by weight 5 to 15 % of a colored material and 95 to 85 % of a resin mixture consisting essentially of:

A. 40 to 60 % by weight of a polymer having about 50 % of the recurring units thereof derived from at least one styrene monomer of the formula:



wherein:

R is hydrogen or methyl, and the balance of such recurring units derived from at least one alkyl methacrylate monomer wherein alkyl comprises 1–4 carbon atoms,

B. 20 to 40 % by weight of a homopolymer of butyl acrylate or butyl methacrylate or a copolymer of butyl acrylate or butyl methacrylate with up to 80 % by weight of methyl acrylate or methyl methacrylate, and

C. 5 to 20 % by weight of a polymeric plasticizer selected from polyvinyl butyral, polyethylene and co(-vinylacetate/ethylene), said particles having a diameter between 1 and 30 microns.

3,933,666

INSULATION MATERIAL

Hiroshi Yoneno, Osaka, and Akira Inami, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 17, 1974, Ser. No. 489,835

Claims priority, application Japan, July 20, 1973, 48-81804; July 20, 1973, 48-81807

Int. Cl.² H01B 3/30; C09K 3/28; C08J 3/20

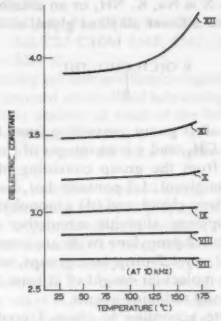
U.S. Cl. 252—62 **3 Claims**

1. An electrical insulation material which comprises:

a. a major amount of 1,2-polybutadiene,

b. from 10 to 150 parts by weight of styrene or styrene derivative selected from the group consisting of chlorostyrene, divinylbenzene, vinyltoluene and ethylvinylbenzene,

c. from 15 to 150 parts by weight of 2,4,6-tribromophenylacrylate per 100 parts by weight of the mixture of said 1,2-polybutadiene and said styrene or styrene derivative, and



d. from 100 to 300 parts by weight of talc powder per 100 parts by weight of said 2,4,6-tribromophenylacrylate.

3,933,667

DOUBLE DISPERSION ACRYLATE OR METHACRYLATE WET DEVELOPER

Hazime Machida, and Zenjiro Okuno, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 12, 1973, Ser. No. 340,111

Claims priority, application Japan, Mar. 11, 1972, 47-24986

Int. Cl.² G03G 9/00

U.S. Cl. 252—62.1 L **7 Claims**

1. A wet developer for use in electrophotography comprising a carrier liquid having an electrical resistance of at least 10^4 ohm cm. and a dielectric constant up to 3, there being two types of particles disposed therein, particles A and particles B;

1. said particles A having a particle size of from 0.1 to 10 μ and comprising pigment particles coated with at least one member of the polymers selected from the group consisting of Group (a);

2. said particles B being adhesive, having a particle size of from 0.01 to 10 μ and comprising at least one member selected from the group consisting of Resin 1, Resin 2 and Resin 3;

Resin 1 comprising a mixture containing at least one member of the polymers selected from the group consisting of Group (a), at least one member of the polymers selected from the group consisting of Group (b), and at least one member of the polymers selected from the group consisting of Group (c);

Resin 2 comprising a mixture containing at least one member of the polymers selected from the group consisting of Group (a), and at least one members of the polymers selected from the group consisting of Group (b); and

Resin 3 comprising a mixture containing at least one member of the polymers selected from the group consisting of Group (b), and at least one member of the polymers selected from the group consisting of Group (c):

the said polymer Groups (a), (b), and (c) being defined as:

Polymer Group (a):

Polymers selected from the group consisting of:

1. copolymers containing at least one monomer selected from the group consisting of styrene, chlorostyrene, hydroxystyrene, vinyl benzoate, aminostyrene, nitrostyrene, dimethyl aminostyrene and methylstyrene together with at least one monomer selected from the group consisting of:

a. alkyl acrylates and methacrylates wherein the alkyl group contains 1 to 6 carbon atoms,
b. alkyl acrylates and methacrylates wherein the alkyl group contains 7 to 12 carbon atoms (there being up to 20 mol % of such monomer in a copolymer),
2. alkyl acrylate polymers and copolymers wherein the alkyl group contains 1 to 6 carbon atoms,
3. alkyl methacrylate polymers and copolymers wherein the alkyl group contains 1 to 6 carbon atoms,
4. alkyl acrylate-alkyl methacrylate copolymers wherein the alkyl group contains 1 to 6 carbon atoms,
5. styrene-butadiene copolymers containing more than 70 mol % styrene,
6. polystyrene,
7. polyvinyl toluene,
8. phenol resins,
9. epoxy resins,
10. petroleum resins
11. rosin denatured alkyd resins,
12. polyamides, and
13. waxes:

Polymer Group (b):

Polymers selected from the group consisting of:
1. copolymers selected from the group consisting of styrene, chlorostyrene, hydroxystyrene, vinyl benzoate, aminostyrene, nitrostyrene, dimethyl amino styrene, and methylstyrene, together with at least one monomer selected from the group consisting of:
a. alkyl acrylates and methacrylates wherein the alkyl group contains from 7 to 12 carbon atoms (there being more than 30 mol % of said monomer in a copolymer),
2. alkyl acrylate polymers and copolymers wherein the alkyl group contains 7 to 12 carbon atoms,
3. alkyl methacrylate polymers and copolymers wherein the alkyl group contains 7 to 12 carbon atoms,
4. styrene-butadiene copolymers containing up to 55 mol % of styrene,
5. chlorinated isobutylene-isoprene copolymers, and
6. butyl rubber:

Polymer Group (c):

Polymers selected from the group consisting of:
1. copolymers containing at least one monomer selected from the group consisting of:
a. hydroxy and epoxy alkyl acrylates and methacrylates wherein the alkyl group contains from 1 to 4 carbon atoms, acrylonitrile, and acrylic and methacrylic acid together with at least one monomer selected from the group consisting of alkyl acrylates and methacrylates wherein the alkyl group contains from 1 to 12 carbon atoms.

3,933,668

INTERGRANULAR INSULATION TYPE POLYCRYSTALLINE CERAMIC SEMICONDUCTIVE COMPOSITION

Yasunori Takahashi, Tokyo; Nobutatsu Yamaoka, Takasaki; Yoshifumi Yamaoka, Haruna, and Shuichi Kakubari, Shibukawa, all of Japan, assignors to Sony Corporation and Taiyo Yuden Co., Ltd., both of, Japan

Filed July 10, 1974, Ser. No. 487,306

Claims priority, application Japan, July 16, 1973, 48-79284; July 16, 1973, 48-79285

Int. Cl.² H01B *3/02*

U.S. Cl. 252—63.5 **5 Claims**

1. An intergranular insulation type semiconductive ceramic composition comprising from 90.68 to 99.88% by weight of polycrystalline $SrTiO_3$, from 0.07 to 5.32% by weight of either Nb_2O_5 or Ta_2O_5, from 0.05 to 4.00% by weight of either GeO_2 or ZnO, and having diffused therein either Bi_2O_3 or a mixture of Bi_2O_3, PbO, and B_2O_3, the diffused material providing a substantially uniform insulating layer about the grain boundaries of the polycrystalline $SrTiO_3$.

3,933,669

FUNCTIONAL FLUID COMPOSITIONS

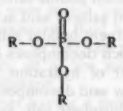
Paul D. Fowlkes, Glen Ellyn, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 406,422, Oct. 15, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,328

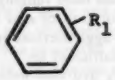
Int. Cl.² C10M *1/46, 3/40*

U.S. Cl. 252—78 **4 Claims**

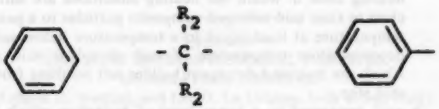
1. A functional fluid composition comprising (1) from about 10% to about 50% by weight based on the total weight of the composition, of a phosphate ester represented by the formula



wherein each R is individually an alkyl group containing from 2 to 12 carbon atoms; an alkoxy alkyl group, containing from 2 to 12 carbon atoms in the alkyl group; phenyl; alkyl substituted phenyl group having the general structure



wherein R_1 is an alkyl radical of 1 to 18 carbon atoms; or an aryl alkyl phenyl group having the general structure and



wherein each R_2 is individually an alkyl of 1 to about 18 carbon atoms, and (2) 10% to about 50% by weight based on the total weight of the composition, of hydrogenated quaterphenyl, 25 to 50% hydrogenated.

3. A composition according to claim 2 wherein 5% to about 80% of the hydrogenated quaterphenyl is replaced with a petroleum derived hydrocarbon oil.

3,933,670

PROCESS FOR MAKING AGGLOMERATED DETERGENTS

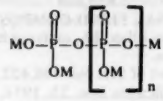
John B. Brill, St. Paul; Charles A. Morris, New Brighton, and Soo-Duck Moon, Bloomington, all of Minn., assignors to Economic Laboratories, Inc., St. Paul, Minn.

Filed Nov. 12, 1973, Ser. No. 414,766

Int. Cl.² C11D *7/56*

U.S. Cl. 252—99 **17 Claims**

1. A continuous single-stage agglomeration process for producing an agglomerated detergent composition comprising the steps of:
a. distributing substantially non-agglomerated particles onto a generally planar, inclined, rotating, sliding bed of particles of detergent ingredients, said substantially non-agglomerated particles consisting essentially of:
1. an at least partially hydrated condensed phosphate salt capable of sequestering hardness-causing metal ions and capable of retaining all of its water of hydration until heated at least to a decomposition temperature above 45°C., said condensed phosphate salt being a sodium or potassium salt of the formula



wherein M is hydrogen, sodium, or potassium, at least one M being sodium or potassium, and *n* is a number ranging from 1 to about 6;

2. a solid chlorine-releasing agent selected from the group consisting of chlorinated isocyanuric acid; a sodium salt of said acid; a potassium salt of said acid; and sodium and potassium double salts, crystalline complex salts, and hydrated salts of said acid;
3. a hydratable detergent builder salt capable of forming a hydrate salt which decomposes and releases at least some of its water of hydration at a decomposition temperature below said decomposition temperature of said condensed phosphate salt; said hydratable detergent builder salt being selected from the group consisting of the following sodium and phosphate salts: the carbonates, bicarbonates, orthophosphates, pyrophosphates, borates, metasilicates, and silicates with a higher silica/sodium or potassium oxide ratio than metasilicate, said ratio ranging up to 3.25:1;

b. continuing the rotation of said bed and contacting said substantially non-agglomerated particles with water in an amount at least sufficient to:

1. form a partially hydrated detergent builder salt, and
2. cause said substantially non-agglomerated particles to agglomerate to form enlarged, composite particles;

c. conveying said enlarged composite particles, after a residence time on said bed of less than 15 minutes, to a heating zone in which the heating conditions are sufficient to raise said enlarged composite particles to a peak temperature at least equal to a temperature below said decomposition temperature of said phosphate salt, at which the hydrated detergent builder salt resulting from said step

b. will converted to a lower level of hydration which is stable under normal storage and handling conditions;

d. discharging said enlarged, composite particles from said heating zone into a relatively cooler environment no earlier than the time said lower level of hydration has been reached but before said chlorine-releasing agent has decomposed and become ineffective as a chlorine source.

3,933,671

GERMICIDAL CLEANING COMPOSITION AND METHOD

Bernard Joseph Heile, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 27, 1974, Ser. No. 446,460

Int. Cl.² C11D *3/065, 3/48, 9/50*

U.S. Cl. 252—107 **1 Claim**

1. A concentrated, physically stable, aqueous germicidal cleaning composition which provides cidal activity against bacteria of the family Pseudomonodaceae consisting of:

Soft Water	66.7 parts
Potassium Hydroxide	0.1 part
Coconut Fatty Acids	0.36 part
Potassium Toluene Sulfonate	11.0 parts
Tetra Potassium Pyrophosphate	13.2 parts
Sodium Salt of the Sulfuric Acid Ester of the Reaction Product of 1 mole of Coconut Fatty Alcohol with about 3 moles of Ethylene Oxide ($NaAE_3S$)	1.3 parts
Sodium n-decyl diphenyl ether disulfonate	1.0 parts
Isopropanol	2.0 parts
4-chloro-2-cyclopentyl phenol (CCPP)	3.0 parts
Sodium Sulfite	1.0 parts

said parts being by weight.

3,933,672

CONTROLLED SUDSING DETERGENT COMPOSITIONS

Guiseppe Bartolotta; Nicolaas Tieme de Oude, and Alfred Alexander Gunkel, all of Brussels, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 23, 1973, Ser. No. 381,659

Claims priority, application United Kingdom, Aug. 1, 1972, 35877/72

Int. Cl.² C11D *3/12, 3/37, 9/36, 17/06*

U.S. Cl. 252—116 **22 Claims**

1. A detergent composition having a controlled suds pattern consisting essentially

i. from about 0.01 to about 10% by weight of a suds controlling agent comprising an intimate mixture of silicone and silica having a surface area greater than 50 m^2/gram releaseably incorporated in a water-soluble or water-dispersible, substantially non-surface active, detergent-impermeable carrier selected from the group consisting of gelatin, agar, gum arabic, algae gel and the condensation products of tallow alcohol and 25 moles or more of ethylene oxide; and

from about 5 to about 95% by weight of a detergent component selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and cationic detergent compound;

wherein the silicone is in a weight ratio to the silica of from about 19:1 to about 1:2 and the carrier is from about 0.1 to about 99% by weight of the suds controlling agent and the carrrier material.

3,933,673

DETERGENT COMPOSITIONS CONTAINING POLYMERIC BUILDERS

Richard Llewelyn Davies, Bebington, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,780

Claims priority, application United Kingdom, Jan. 8, 1970, 925/70

Int. Cl.² C11D *3/37*

U.S. Cl. 252—135 **6 Claims**

3. A dry detergent composition comprising a detergent active compound selected from the group consisting of anionic, nonionic, zwitterionic, amphoteric compounds and mixtures thereof and as a builder therefore a partial alkali metal salt of a polymeric aliphatic carboxylic acid containing at least 50 percent by weight of monomeric units from at least one carboxylic acid selected from the group consisting of acrylic acid, and maleic acid, said polymeric aliphatic carboxylic acid having a molecular weight of from about 5,000 to about 1,000,000, the partial salt being neutralised to the extent of not more than about 60 percent by weight, and the ratio of the detergent active compound to the partial salt being from about 3:1 to about 1:10 parts by weight.

3,933,674

CLEANING COMPOSITION

Albert M. Farnsworth, 616 N. Arizona Ave., Chandler, Ariz. 85224

Filed Feb. 7, 1975, Ser. No. 547,786
Int. Cl.² C11D 7/50
U.S. Cl. 252—171 9 Claims

1. A composition for removing contaminating resinous, gummy or tarry residues from surfaces without adversely affecting paints or varnishes, said composition being substantially non-irritating to the skin and eyes of human beings, which comprises, in combination, the following ingredients in weight proportions, as indicated, based on the weight of the whole composition:

A. about 5 to 92% of a base hydrocarbon oil of substantially the boiling range of kerosene, which is substantially free of objectionable odor and having not more than 5% of sulfonatable constituents,

B. about 5 to 90% of a limonene type citrus distillate having high solvency for the contaminant and having a refractive index between about 1.4718 and 1.4722 at 20° C., with a specific gravity between about 0.838 and 0.843, having a resin content not more than about 0.10% and aldehyde content not in excess of about 0.90%,

C. 0.5 to 6.0% of a skin lubricant selected from the class which consists of lanolin and wool grease, and

D. 0.5 to 3% of a surface active agent to promote wetting of the contaminant by the composition.

3,933,675

CURING AGENTS

Joseph Theodore Willett, Clayton, Mich., assignor to Anderson Development Company, Adrian, Mich.

Filed Apr. 3, 1974, Ser. No. 457,488
Int. Cl.² C08G 71/04
U.S. Cl. 252—182 6 Claims

1. A curing agent for polyurethane prepolymers which is a mixture consisting essentially of (A) methylene-bis-orthochloroaniline; (B) 4,4'-diamino-2-chloro-2'-carbo-lower-alkoxydiphenylmethane; and (C) methylene-bis-lower-alkylanthranilate.

3,933,676

STABILIZED AQUEOUS SOLUTIONS OF SODIUM BOROHYDRIDE

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed Apr. 8, 1974, Ser. No. 459,058
Int. Cl.² C09K 3/00; D21C 3/04
U.S. Cl. 252—188 2 Claims

1. A stabilized aqueous sodium borohydride solution comprising from about 35 to about 46.9 percent of sodium hydroxide, from about 9.35 to about 12.9 percent sodium borohydride, zinc in an amount of 0.5 to 3 percent in the form of dissolved zincate, and the balance water.

3,933,677

PREPARATION OF AQUEOUS DISPERSIONS OF BLOCKED AROMATIC POLYISOCYANATES

Carl Albert Aufdermarsh, Jr., Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed May 24, 1974, Ser. No. 473,160
Int. Cl.² C09K 3/00; B23B 27/00; C08L 61/06; C07C 79/46
U.S. Cl. 252—188.3 R 7 Claims

1. A process for the production of an aqueous dispersion of an aromatic polyisocyanate blocked with a phenolic compound which comprises mixing (a) an aromatic polyisocyanate dissolved in a water-soluble organic solvent that is nonreactive with the aromatic polyisocyanate, and (b) an aqueous solution containing a dissolved phenolic compound selected from the class consisting of phenol and resorcinol, the number of moles of the phenolic compound being at least equal to the number of equivalents of isocyanate groups present, said mixing taking place in the presence of a catalytic amount of an alkali metal hydroxide at a temperature of 25° to 75°C.

3,933,678

OPTICALLY CLEAR ORGANOSILICON COMPOUNDS

Craig E. Graham, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 402,221, Oct. 1, 1973, abandoned. This application July 29, 1974, Ser. No. 492,577
Int. Cl.² F21V 9/00
U.S. Cl. 252—300 8 Claims

1. A composition having a light transmission of at least 80% at 550 milli micron wave length, consisting essentially of

1. a phenylmethylsiloxane fluid have a refractive index at 25°C. of from 1.42 to 1.47 said phenyl and methyl groups being essentially all of the substituents on the silicon atoms of said siloxane,

2. a silica thickener having a surface area of at least 100 square meters per gram as measured by the BET Method in amount of from 5 to 25 parts by weight based on 100 parts by weight of (1), and

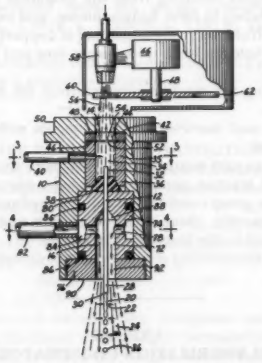
3. a polyether soluble in (1) and being of the group consisting of polyethylene oxide, polypropylene oxide, copolymers of polyethylene oxide and polypropylene oxide, copolymers of ethylene oxide and siloxanes, copolymers of propylene oxide and siloxanes and copolymers of ethylene oxide, propylene oxide and siloxanes, the substituents on the silicon in the siloxane portion of the copolymers being of the group consisting of lower aliphatic hydrocarbon and phenyl radicals, there being at least 25% by weight of said alkylene oxides in the copolymers, the proportion of (3) being from 1 to 30 parts by weight based on 100 parts by weight of (1).

3,933,679

UNIFORM MICROSPHEROIDAL PARTICLE GENERATING METHOD

William H. Weitzel, and Lee D. La Grange, both of San Diego, Calif., assignors to Gulf Oil Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 217,853, Jan. 14, 1972, Pat. No. 3,731,851. This application May 8, 1973, Ser. No. 358,410
Int. Cl. C09k 3/00
U.S. Cl. 252—301.1 S 5 Claims



1. In a sol-gel process for the manufacture of solid microspheres of inorganic oxides, carbides or nitrides in which a liquid sol of the inorganic material is dispersed into droplets, the droplets are solidified to a form-stable condition by contact with a gelling fluid for the sol and the gelled, solidified droplets are subsequently sintered to provide solid microspherical particles, the improvement comprising carrying out in combination the steps of providing a jetstream of a liquid

sol feedstock having a viscosity of from about 10 to about 60 centistokes, inducing uniformly periodic varicose instabilities in the jetstream having a wavelength of at least about pi times the unperturbed diameter of the jetstream, providing a concurrent, coaxial stripping flow of a first fluid surrounding the jetstream to enhance the varicose instabilities in order to cause the uniform dispersion of the jetstream into uniform spherical droplets, said first fluid being substantially inert with respect to causing the solidification of said sol, and subsequently contacting said droplets with a gelling fluid compatible with said first fluid and which is interactive with the sol to solidify the droplets.

3,933,680

STABILIZING COMPOSITIONS FOR POLYVINYLCHLORIDE

Anatole Wowk, Edison, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 43,230, June 3, 1970, abandoned. This application July 16, 1971, Ser. No. 163,451

Int. Cl.[2] C08J *3/20*

U.S. Cl. 252—406 **1 Claim**

1. A novel composition for stabilizing a homopolymer or copolymer of vinyl chloride against the deteriorative effects of heat which comprises (1) a first stabilizer selected from the group consisting of butylchlorotin S,O mercaptoacetate, butylchlorotin S,O mercaptopropionate and butylchlorotin S,O mercaptobenzoate and (2) a second stabilizer selected from the group consisting of dibutyltin S,S′ bis (isooctyl mercaptoacetate) and dibutyltin S,S′ di(lauryl mercaptide).

3,933,681

ACTIVATION OF COPPER SALT PHENOL OXIDATION CATALYSTS

David A. Hutchings, Stow, and Michael F. Farona, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 13, 1974, Ser. No. 450,946

Int. Cl.[2] B01J *27/32, 27/28;* **C07C** *49/62*

U.S. Cl. 252—413 **3 Claims**

1. A method of reactivating a deactivated phenol oxidation catalyst complex resulting from the oxidation of phenol in methanol solution to form benzoquinone, said oxidation catalyst selected from the group consisting of copper(I) or copper-(II) salts of halogen ions, thiocyanate ions and cyanide ions comprising

a. separating the inactive complex from the reaction solution

b. mixing said inactive catalyst complex with phenol and methanol

c. adding to said mixture from .001 mole to 1.0 mole per gram of inactive complex of at least one acid selected from the group consisting of sulfuric, hydrochloric, nitric, trifluoroacetic, phosphoric, perchloric and toluene sulfonic acid to the inactive catalyst and

d. heating the resulting mixture until the complex dissolves.

3,933,682

PHOTOPOLYMERIZATION CO-INITIATOR SYSTEMS

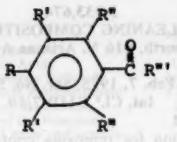
Anthony J. Bean, East Rutherford, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 328,442, Jan. 31, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,579

Int. Cl.[2] B01J *31/02, 31/12*

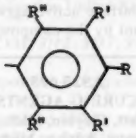
U.S. Cl. 252—431 R **2 Claims**

1. A photopolymerization co-initiator system which consists essentially of (a) about 1–30 parts of at least one compound having the formula

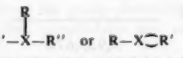


wherein R, R′, and R″ is each hydrogen, C_{1-14} alkyl, aryl, alkylaryl, alkoxy, aryloxy, halogen, halogenated C_{1-14} alkyl, halogenated aryl, amino, or amino N-substituted with alkyl, aryl, β-alkanol, or a combination of these, and may be the same or different; and R‴ is hydrogen, C_{1-14} alkyl, halogenated alkyl, aryl, —OZ where Z is C_{1-14} alkyl or aryl;

where Y is hydrogen, C_{1-14} alkyl, aryl, or alkylaryl and Q is hydrogen, C_{1-14} alkyl, aryl, alkylaryl, alkoxy, or aryloxy; or



wherein R, R′, and R″ is each hydrogen, C_{1-14} alkyl, aryl, alkylaryl, alkoxy, aryloxy, halogen, halogenated C_{1-14} alkyl, halogenated aryl, amino, or amino N-substituted with alkyl, aryl, β-alkanol, or a combination of these, and may be the same or different; (b) about 1–30 parts of at least one compound having the formula



wherein X is nitrogen, phosphorus, arsenic, bismuth, or antimony and R, R′, and R″ is each alkyl, hydroxyalkyl, aryl, aralkyl, or alkaryl and may be the same or different and one or both of R and R″ may be hydrogen; and (c) 1–30 parts of at least one halogenated hydrocarbon.

3,933,683

PRETREATMENT OF CATALYST EMPLOYED IN THE HYDROGENATION OF HYDROCARBONS

Lee Hilfman, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 23, 1973, Ser. No. 418,700

Int. Cl.[2] B01J *27/04*

U.S. Cl. 252—439 **3 Claims**

1. In a method for the activation of a mass of a hydrogenation catalyst containing cobalt and molybdenum components present in an oxidized form, the steps of:

a. intimately contacting said mass of catalyst with gaseous hydrogen, containing a sulfur compound, at a temperature within the range of from about 550°F. to about 800°F. for a sufficient time to effect the reduction and sulfiding of a major proportion of said metallic components; and,

b. stripping the resulting reduced and sulfided catalyst with substantially pure hydrogen at a temperature within the range of from about 750°F. to about 900°F.

3,933,684

METHOD OF FORMING PALLADIUM OXIDE AND PALLADIUM PARTICLES

Henry G. Petrow, Cambridge, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech Company, Newton Highlands, Mass.

Continuation of Ser. No. 215,149, Jan. 3, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,182

Int. Cl.[2] B01J *21/18*

U.S. Cl. 252—447 4 Claims

1. A method of forming a particulated catalytic structure, that comprises, contacting a substantially NO_2 free — substituted therefor aqueous solution of palladium dissolved in concentrated chloride-free nitric acid with a water-immiscible high molecular weight amine in amount sufficient to bring the pH of the aqueous phase to substantially 3.0 and extracting the aqueous phase, thereby producing an aqueous colloidal sol of palladium oxide particles substantially in the range of 20–40 A in particle size.

3,933,685

METHOD FOR PRODUCING CATALYST IMPREGNATED ALUMINA EXTRUDATES

Galen K. Madderra, and William C. Ziegenhain, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 19, 1974, Ser. No. 489,959

Int. Cl.[2] B01J *21/04, 23/16, 23/74*

U.S. Cl. 252—464 7 Claims

1. In a method for producing catalyst impregnated alumina extrudates by admixing acid, said acid being selected from the group consisting of inorganic acid, aliphatic carboxylic organic acid containing from 1 to 3 carbon atoms, halogenated aliphatic carboxylic acid containing from 2 to 3 carbon atoms and mixtures thereof, water and alpha alumina monohydrate to form an extrudable mixture, extruding the mixture to produce green alpha alumina monohydrate extrudates and drying and calcining said green extrudates, the improvement comprising; impregnating said green extrudates prior to said drying with an aqueous solution of a catalytic metal compound selected from the group consisting catalytic metal salt, catalytic metal oxide, catalytic metal hydroxide, catalytic metal acid and mixtures thereof in an amount sufficient to impregnate substantially the entire volume of said extrudates with said catalytic metal compound thereby improving the extrudate properties.

3,933,686

CATALYST FOR THE PRODUCTION OF ACRYLONITRILE, ACRYLIC ACID AND ACROLEIN

Natale Ferlazzo, Milan; Gian Fausto Buzzi, Arona (Novar), and Marcello Ghirga, Bresso (Milan), all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,351

Claims priority, application Italy, Nov. 30, 1972, 32280/72

Int. Cl.[2] B01J *23/16, 23/64*

U.S. Cl. 252—467 1 Claim

1. A catalyst for use in the production of acrylonitrile, acrylic acid, and acrolein consisting of silver oxide and molybednum oxide in a molar ratio of silver oxide to molybdenum oxide in the range of from about 0.1:1 to 2.0:1.

3,933,687

METHOD OF MANUFACTURING CARBON BRUSHES FOR ELECTRICAL MACHINES

Walter Holl, and Martin Scholpp, both of Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 23, 1974, Ser. No. 435,959

Claims priority, application Germany, Feb. 28, 1973, 2309834

Int. Cl.[2] H01B *1/06*

U.S. Cl. 252—511 5 Claims

1. Method of manufacturing carbon brushes for use in electrical machinery, comprising the steps of:

mixing carbon particles together with particles of a binder,

pressing the mixture in a mold to form a brush blank,

removing the pressed blank from the mold and sintering it at a temperature between 300°C and 500°C,

said binder being pressed in an amount which is between 0.5 and 50% by weight of the amount of carbon in said mixture, said binder consisting of a material that is a readily flowing and chemically stable liquid at the temperature of sintering, and is selected from the group consisting of polyaryl sulfides and polyaryl ethers.

3,933,688

METHOD FOR LITHIATING METAL CHALCOGENIDES AND INTERCALATED PRODUCTS THEREOF

Martin B. Dines, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 487,860, July 12, 1974, abandoned. This application Sept. 30, 1974, Ser. No. 510,383

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—520 9 Claims

1. A method of lithiating metal chalcogenides of the formula MZ_y wherein: y

M is an element selected from Group IVB, Group VB elements of the Periodic Table of the Elements, molybdenum, tungsten, technetium, platinum, rhenium, germanium, tin and lead;

y is a numerical value between about 1.0 and about 4.0; and

Z is an element selected from the group consisting of sulfur, selenium and tellurium, provided that when M is vanadium and y is 2, Z is selected from selenium and tellurium only; comprising

adding at least a stoichrometric amount of a lithium compound to said metal chalcogenide, said lithium compound being selected from the group consisting of LiR_1, $LiC(R_1)_3$, $LiN(R_1)_2$, $LiBH(R_1)_3$, $LiR_1.R_3$ and $LiAlH_4.R_2$ wherein:

R_1 is a hydrocarbon radical having from 1 to 8 carbon atoms and R_2 is a chelating polyamine.

3,933,689

FIRE RETARDANT COMPOSITIONS

Neil Hunter Ray; Bryan Shaw, and Bruce Cochran Lane, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 23, 1973, Ser. No. 363,158

Claims priority, application United Kingdom, June 8, 1972, 26806/72; Jan. 16, 1973, 2190/73

Int. Cl.[2] C08K *3/32, 3/40*

U.S. Cl. 260—2.5 FP 26 Claims

1. A reinforced thermosetting composite material of improved fire retardance containing a thermosetting resin matrix, between 2 and 60% by weight, based on the weight of thermosetting resin matrix component, of a low softening point inorganic oxide glass having a transformation temperature not greater than 300°C and from 2 to 20% by weight, based on the weight of the thermosetting resin matrix component, of at least one blowing agent, which decomposes upon heating above a temperature between 150°C and 400°C with evolution of a non-flammable gas, the combination of said glass and blowing agent improving the fire retardance of the thermosetting resin matrix.

3,933,690

DIHALOBUTENEDIOL CONTAINING URETHANE FOAM COMPOSITIONS

Gaetano F. D'Alelio, South Bend, Ind., and Erich Kuehn, Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 123,109, March 10, 1971, Pat. No. 3,812,047. This application Dec. 13, 1973, Ser. No. 426,728
Int. Cl.² C08G 18/14, 18/32, 18/48
U.S. Cl. 260—2.5 AM 5 Claims

1. A flame-retardant polyurethane foam composition formed in the presence of a blowing agent which comprises the product formed by the reaction of an organic di- or polyisocyanate and a polyol blend comprised of a mixture of 2,3-dihalo-2-butene-1,4-diol and a polyhydroxy compound selected from the group consisting of sorbitol, mono- and di-saccharides and alkoxylated sorbitol and mono- and di-saccharides containing up to 10 oxyalkylene or oxyarylene groups per hydroxyl groups of the sorbitol and mono- and di-saccharide wherein the hydroxyl number of said blend is from about 300 to about 600 and said 2,3-dihalo-2-butene-1,4-diol is present at a concentration of from about 15% to 40% based on the weight of the polyol blend.

3,933,691

CRUSHED FOAM-BACKED FABRICS AND EMULSIONS FOR PRODUCING THE SAME

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Jan. 16, 1974, Ser. No. 433,634
Int. Cl.² C08J 9/12
U.S. Cl. 260—2.5 L 14 Claims

1. A pigmented foam comprising an aqueous emulsion comprising an aqueous medium having colloidally suspended therein an emulsion copolymer consisting essentially of from 15–40% ethylene, from 3–9% of cross-linking monomers, balance vinyl acetate, said copolymer having a molecular weight of at least about 300,000, said emulsion containing dispersed pigment in a pigment to binder weight ratio of from 0.1:1 to 2:1 and surfactant to stabilize the same, said emulsion having whipped therein air in an amount increasing the volume of said emulsion from about 5 to about 10-fold its original volume.

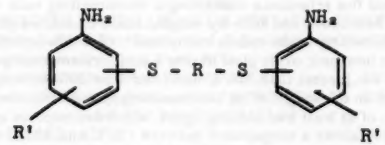
3,933,692

URETHANE FOAM CATALYST

Bernard G. Kushlefsky, Edison, and Kenneth Treadwell, Rahway, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed Mar. 14, 1974, Ser. No. 451,204
Int. Cl.² C08G 18/16
U.S. Cl. 260—2.5 AC 13 Claims

1. The process of making a cellular polyurethane which comprises reacting a polyalkylene polyol having reactive hydrogen atoms as determined by the Zerewitinoff method, an organic poly-functional isocyanate, water, and a gel catalyst, said reaction being carried out in the presence of a gel catalyst and a blowing catalyst comprising at least one compound selected from those of the formulae:



wherein R is a hydrocarbon, and R′ is selected from the group consisting of hydrogen, halogens, and hydrocarbons.

3,933,693

PRODUCTION OF FLAME RETARDANT FLEXIBLE POLYURETHANE FOAMS

David C. Priest, Charlotte, N.C., and John E. Brandien, deceased, late of Mooresville, N.C. (by Helen Brandien, executrix), assignors to Reeves Brothers Inc., New York, N.Y.

Filed June 24, 1974, Ser. No. 482,151
Int. Cl.² C08G 18/32; B62D 25/14
U.S. Cl. 260—2.5 AJ 7 Claims

1. In a process for producing flexible polyurethane foams having a porosity in the range from about 0.5 to about 10 cubic feet per minute, in which an isomeric mixture of 2,4- and 2,6-tolylene diisocyanate is reacted with a polyether polyol in the presence of a small amount of water and a catalytic amount of a polymerization catalyst, the improvement which comprises:

a. reacting the polyether polyol with a sufficient amount of an isomeric mixture of tolylene diisocyanate which contains not more than about 76 percent by weight of the 2,4-isomer, and

b. incorporating into the reaction mixture prior to polymerization from about 1 to about 8 percent by weight of dibromoneopentyl glycol based on the weight of the polyether polyol used in the polymerization reaction.

3,933,694

LOW SMOKE-OUTPUT POLYURETHANE AND POLYISOCYANURATE FOAMS

Donald C. Wysocki, Pittsburgh, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed July 10, 1974, Ser. No. 487,416
Int. Cl.² C08G 18/14
U.S. Cl. 260—2.5 AW 4 Claims

1. A low smoke output, polyurethane or polyisocyanurate-urethane foam composition formed by reacting, in an NCO-/OH ratio of from 1/1 to 50/1, one or more compounds having reactive —NCO groups with one or more polyols having reactive —OH groups; the foam composition containing 0.5 to 25.0% of at least one organosulfur compound, based on the weight of foam composition wherein the organosulfur compound is a sulfide or a thiocarbonate.

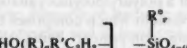
3,933,695

HYDROXYALKENYLSILOXANE RIGID POLY URETHANE FOAM STABILIZERS

George M. Omietanski, and Vincent T. Chuang, both of Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

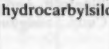
Division of Ser. No. 319,786, Dec. 29, 1972, Pat. No. 3,842,112. This application July 17, 1974, Ser. No. 489,125
Int. Cl.² C08G 18/14
U.S. Cl. 260—2.5 AH 3 Claims

1. A method for producing a rigid polyurethane foam by reacting and foaming a foam formulation comprising (a) a polyether containing at least two hydroxyl groups and having a hydroxyl number from about 200 to about 1000, (b) an organic polyisocyanate, (c) a catalyst for the reaction of (a) and (b) to produce the polyurethane, (d) a blowing agent and (e) a hydroxyalkenylsiloxane consisting essentially of (A) at least one hydroxyalkenylsiloxane unit having the formula:



wherein R is a divalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, R′ is an arylene group, a cycloalkylene group that has no hydrogen bonded to the carbon atom attached to the C_2H_2 group and that is free of aliphatic carbon to carbon multiple bonds or a divalent-CR''_2- group, R″ and R° are each monovalent hydrocarbon groups free of aliphatic carbon to carbon multiple bonds and having from 1 to 10 inclusive carbon atoms, C_2H_2 is a -CH=CH- or a

group, each hydroxyalkenylsiloxane group has no more than 20 carbon atoms, a has a value of 0 or 1, b has a value of 1, 2 or 3, c has a value of 0, 1 or 2, and (b+c) has a value of 1, 2 or 3; and (B) at least three hydrocarbylsiloxane units represented by the formula:



wherein R^{oo} is a monovalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds and having from 1 to 10 inclusive carbon atoms and d has a value of 1, 2 or 3, the molecular weight of the siloxane portion of the hydroxyalkenylsiloxane being from about 250 to about 1300 inclusive, and, when dihydrocarbylsiloxane units ($R_2^{oo}SiO$ units) are present, the ratio of hydroxyalkenylsiloxane units to dihydrocarbylsiloxane units is at least 0.5 to 1.0.

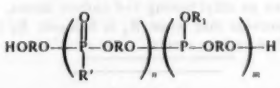
3,933,696

POLYALKYLENE GLYCOL POLY-PHOSPHORUS COMPOUNDS IN POLYURETHANE FOAMS

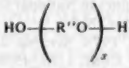
Kyung Sup Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 198,006, Nov. 11, 1971, Pat. No. 3,840,622. This application July 22, 1974, Ser. No. 490,525
Int. Cl.² C08G *18/14*, *18/50*
U.S. Cl. 260—2.5 AR **7 Claims**

1. A flame retardant polyurethane foam containing as a chemically bonded integral part thereof the residue of a polyphosphorus compound having the formula:



wherein R is a polyalkylene glycol residue defined as that portion remaining after two hydroxyl groups have been removed from a glycol having the formula:



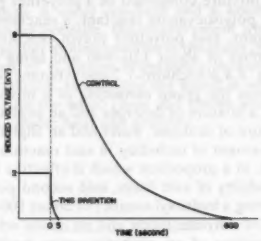
wherein R″ is an alkylene group of from 2 to about 20 carbon atoms, which is straight chain, branch chain, or a mixture thereof, and X designates the number of repeating alkylene ether units and is from 2 to about 20; R_1 is a C_1–C_{10} alkyl residue; R′ is an allylic residue formed from a compound selected from the group consisting of allyl bromide, allyl chloride, 3,4-dichlorobutene-1, 1,2,3-trichloropropene and 1,4-dichlorobutene-2; *m* is a number in the range from 0 to about 25; and *n* is a number in the range from 1 to about 25 with the proviso that the sum of *m*+*n* is in the range of from about 2 to about 50.

3,933,697

METHOD FOR PREPARING A POLYURETHANE FOAM COMPRISING QUATERNARY AMMONIUM SALT AS ANTISTATIC AGENT

Osamu Fujii, Kounosu; Toshio Kishimoto, Kawagoe; Hisao Kosuge, Kawagoe; Ryoji Nagamine, Kawagoe, and Sumio Shimada, Kawagoe, all of Japan, assignors to Toyo Rubber Chemical Industrial Corporation, Tokyo, Japan

Filed July 30, 1974, Ser. No. 493,056
Claims priority, application Japan, July 31, 1973, 48-86143
Int. Cl.² C08G *18/14*; C08J *9/00*, *9/40*
U.S. Cl. 260—2.5 A **5 Claims**

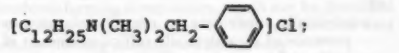


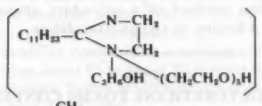
1. A method for preparing an antistatic polyurethane foam comprising reacting polyol with polyisocyanate to form a polyurethane foam in the presence of about 0.05 to 10 parts by weight based on 100 parts by weight of the polyol of a quaternary ammonium salt as an antistatic agent selected from the group consisting of:

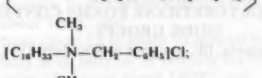
$[C_{12}H_{25}N(CH_3)_3]ClO_4$;

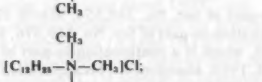
$[C_{12}H_{25}N(CH_3)_2C_2H_4OH]ClO_4$;

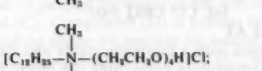
$[C_{12}H_{25}N(CH_3)_2C_2H_4OH]Br$;



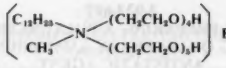








and



and a mixture thereof.

3,933,698

PREPARATION OF LOW FRIABILITY RIGID POLYURETHANE FOAM

Stephen Fuzesi, and Allan H. Syrop, both of Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 23, 1974, Ser. No. 508,542
Int. Cl.² C08G *18/14, 18/50*
U.S. Cl. 260—2.5 AS **18 Claims**

1. In a process of preparing a rigid polyurethane foam from a reaction mixture comprised of a polyether polyol reactant, an organic polyisocyanate reactant, a reaction catalyst and a forming agent, said polyether polyol reactant having a hydroxyl number of about 150–800 and being the product of condensing 4,4,4-trichloro-1,2-epoxybutane with a mixture selected from the group consisting of a mixture of dextrose and water, a mixture of dextrose and an aliphatic diol or triol, and a mixture of dextrose, water and an aliphatic diol or triol, the improvement of including in said reaction mixture a second polyol, in a proportion which is effective in reducing the surface friability of said foam, said second polyol characterized by having a hydroxyl number of about 100–800 and being an adduct of ethylene oxide and an amine selected from the group consisting of an aliphatic amine having 1–8 carbon atoms, an aromatic primary amine having 6–8 carbon atoms, an alkanolamine in which each alkanol group contains 2–5 carbon atoms, and a mixture thereof.

3. The process of claim **1** wherein said amine is selected from the group consisting of ethylene diamine, toluene diamine, an ethanolamine, and a mixture thereof.

3,933,699

CATALYST-REACTANT SYSTEMS FOR THE PREPARATION OF CARBODIIMIDE FOAMS

Peter T. Kan, Plymouth, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 2, 1974, Ser. No. 511,113
Int. Cl.² C08G *18/14, 18/18, 18/20*
U.S. Cl. 260—2.5 BF **12 Claims**

1. A process for the preparation of rigid cellular foams characterized by carbodiimide linkages, consisting essentially of:

catalytically condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of carbodiimide catalyst and an effective amount of an exotherm generating reactant which is either (a) an enamine which is the reaction product of a secondary amine and an aldehyde or a ketone or (b) an oxazolidine.

3,933,700

MODIFIED POLYURETHANE FOAMS CONTAINING IMIDE GROUPS

John K. Allen, Batavia, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 340,354, March 12, 1973, which is a continuation-in-part of Ser. No. 119,876, March 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 770,394, Oct. 24, 1968, abandoned. This application Dec. 10, 1974, Ser. No. 531,234
Int. Cl.² C08J *9/06*
U.S. Cl. 260—2.5 AT **4 Claims**

1. In combination with a thermally stable and flame resistant rigid foam composition comprising the reaction product of one equivalent based on hydroxyl of a polyol having an average hydroxyl functionality of at least three and a molecular weight below 2000 and from about 0.5 to about 12 equivalents based on isocyanate of a polyarylpolyisocyanate-containing component, the improvement which comprises the polyarylpolyisocyanate-containing component being the monomeric imide-containing polyarylpolyisocyanate derivative prepared by pre-reacting a mixture consisting essentially of a polyarylpolyisocyanate consisting of 2–10 benzene or methyl-, ethyl-, or propyl-substituted benzene rings linked by methylene groups, said benzene rings having one isocyanate functional group per ring, and a compound selected from the group consisting of phthalic anhydride, tetrachlorophthalic anhydride and tetrabromophthalic anhydride, in a weight ratio of said polyarylpolyisocyanate to said anhydride of about 2:1 to 10:1 and at a temperature between 210°C. and 300°C. until a liquid product of the desired viscosity is obtained, to thereby convert from about 25 to 75 percent of the original anhydride groups to imide groups and to thereby incorporate an imide into the rigid form composition.

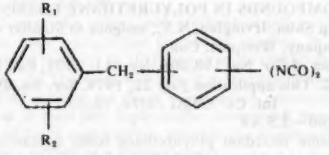
3,933,701

HIGH RESILIENCE POLYURETHANE FOAM

John E. Puig, Wallingford, and Ralph A. Colafati, III, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 29, 1975, Ser. No. 545,255
Int. Cl.² C08G *18/14*
U.S. Cl. 260—2.5 AT **17 Claims**

1. In a process for preparing polyurethane foam from a reaction mixture comprised of an organic polyisocyanate, a polyether polyol reactant characterized by (1) a molecular weight of at least about 4,000, (2) an aliphatic alcohol nucleus having from about 2 to about 8 hydroxyl groups, (3) polyoxyalkylene chain segments attached to said nucleus, and (4) a ratio of primary to secondary hydroxyl end groups ranging from about 1.5:1 to about 5.5:1, a foaming agent and a reaction catalyst, the improvement which comprises including in said reaction mixture a foam stabilizing proportion of a methylene-bridged diaryl polyisocyanate of the formula:



wherein R_1 is NCO or halogen, and
R_2 is H or an alkyl having 1–4 carbon atoms,
with the proviso that when R_1 is halogen, R_2 is an alkyl having 1–4 carbon atoms.

3,933,702

AQUEOUS RELEASE COATING COMPOSITIONS FOR PRESSURE SENSITIVE ADHESIVES

Ronald J. Caimi, Somerset, and Walter F. Schlauch, Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed July 10, 1974, Ser. No. 487,159
Int. Cl.² C08L *1/28, 43/04*
U.S. Cl. 260—17 R **6 Claims**

1. A release coating composition suitable for use with pressure sensitive adhesives in rolled form comprising:

A. a hydrocolloid stabilized aqueous emulsion of a film forming vinyl polymer having a T_g of from 0° to 60°C. and selected from the group consisting of:

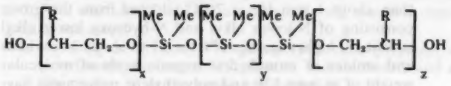
i. a crosslinkable copolymer from at least one crosslinkable monomer with at least one member of the group consisting of vinyl acetate; vinyl acetate and at least one member selected from the group consisting of C_2–C_{18} alkyl esters of acrylic and methacrylic acid, C_1–C_8 dialkyl esters of

maleic, fumaric or itaconic acid, ethylene and vinyl chloride; styrene and at least one C_2–C_{18} alkyl ester of acrylic or methacrylic acid; and vinyl chloride and at least one C_2–C_{18} alkyl ester of acrylic or methacrylic acid; and

ii. an emulsion polymer selected from the group consisting of vinyl acetate homopolymers; copolymers of vinyl acetate and at least one member selected from the group consisting of C_2–C_{18} alkyl esters of acrylic and methacrylic acid, C_1–C_{18} dialkyl esters of maleic, fumaric or itaconic acid, ethylene and vinyl chloride; copolymers of styrene and at least one C_2–C_{18} alkyl ester of acrylic and methacrylic acid; and copolymers of vinyl chloride and at least one C_2–C_{18} alkyl ester of acrylic and methacrylic acid; said emulsion polymer containing a thermosetting resin to effect crosslinking; and

B. from about 0.5 to 20 percent by weight of the emulsion polymer solids, of a release promoting compound selected from the group consisting of:

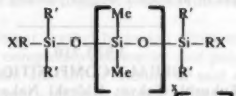
i. polysiloxanes of the general formula:



wherein R is H or an aryl, higher alkyl or alkyl substituted aryl group containing less than 20 carbon atoms, and x, y and z are integers ranging from 1 to 4; and

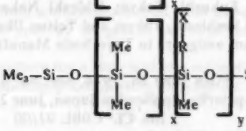
ii. organofunctional silicones of one of the following general formulas:

II(a)



or

II(b)



wherein R is an organic spacer other than alkyleneoxy or polyalkyleneoxy, R′ is an alkyl or alkoxy group, X is a reactive member selected from the group consisting of hydroxy, mercapto, amino, carboxyl, chloroalkyl, and vinyl, and x and y are integers of from 1 to 4.

3,933,703

BLENDS OF ETHYLENE/VINYL CHLORIDE/VINYL ACETATE COPOLYMER WITH NITROCELLULOSE

Armand Di Giacomo; Charles Vincent Murphy, both of Wilmington, Del., and Paul Swithin Pinkney, West Chester, Pa., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 20, 1974, Ser. No. 535,136

Int. Cl.² C08L 1/18

U.S. Cl. 260—17 R **11 Claims**

1. A coating comprising a blend of nitrocellulose and a copolymer having an inherent viscosity below 0.4 dl./g. in acetone at 30°C, at a concentration of 0.5 g./100 ml. consisting essentially of 6 to 32 percent by weight ethylene, 36 to 65 percent by weight vinyl chloride and 23 to 50 percent by weight vinyl acetate in an organic solvent system, the ratio of nitrocellulose to copolymer being 80:20 to 20:80.

3,933,704

MANUFACTURE OF WOOD MATERIALS CONTAINING WOOD PROTECTANT

Manfred Siegler, Frankenthal, and Otto Froede, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 17, 1974, Ser. No. 515,551

Claims priority, application Germany, Oct. 17, 1973, 2352052

Int. Cl.² C08L 1/00

U.S. Cl. 260—17.2 **2 Claims**

1. In an improved process for the production of waterproof chipboard which also contains wood protectants by mixing wood chips, a binder selected from the group consisting of alkaline phenol formaldehyde resins, urea/formaldehyde resins, melamine/formaldehyde resins and urea/melamine/formaldehyde resins, a water repellent and a wood protectant and heating under pressure, the improvement which consists in blending together molten paraffin as the water repellent and the sodium salt of N-nitroso-N-cyclohexylhydroxylamine as the wood protectant, emuslifying the blend in water, mixing the emulsion with the wood chips and binder and curing the resultant blend under heat and pressure.

3,933,705

RAPID-SETTING POLYURETHANES PREPARED IN THE PRESENCE OF A FATTY MATERIAL AND AN ALIPHATIC LIQUID HYDROCARBON

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 449,873, March 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 392,590, Aug. 29, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,592

Int. Cl.² C08K 5/01

U.S. Cl. 260—18 TN **21 Claims**

1. A solid, rigid, non-cellular, non-porous polyurethane having a density of at least about 1 g/cc, a percent elongation of < 100, resulting from the admixture of the components of a polyurethane-forming composition, which can be demolded within 5 minutes after admixture of said components, said polyurethane-forming composition comprising

A. a polyether polyol having a functionality of from 2 to about 8 and a hydroxyl equivalent weight of from about 60 to less than about 250;

B. an organic polyisocyanate;

C. a modifier composition consisting essentially of

1. from about 85 to about 30 percent by weight of a liquid aliphatic hydrocarbon having a boiling point of at least about 150°C and

2. from about 15 to about 70 percent by weight of a liquid fatty acid, fatty oil or mixture thereof having a boiling point of at least about 150°C; and

D an organo-metallic catalyst for urethane formation;

wherein components (A) and (B) are present in quantities so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1; component (C) is present in quantities of from about 10 to about 50 percent by weight of the sum of components (A), (B) and (C); Component (D) is present in quantities of from about 0.1 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); with the proviso that when component (A) is an amine initiated polyether polyol, the quantity of component (D) may be zero and when component (A) is a difunctional polyether polyol, then the average NCO-functionality of component (B) is at least about 2.5.

3,933,706

NONFLAMMABLE BINDER COMPOSITION

Iwao Momiyama, and Tatsuo Fukushima, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed Oct. 8, 1974, Ser. No. 513,044

Claims priority, application Japan, Oct. 12, 1973, 48-114532; Oct. 24, 1973, 48-118938

Int. Cl.² C09D *1/04, 3/76, 5/18*

U.S. Cl. 260—22 S 9 Claims

1. A nonflammable binder composition which comprises (A) 30 to 80 weight percent of water-soluble silicate represented by the formula:

$M_2O.xSiO_2$

wherein M is an alkali metal or a nitrogen-containing basic group selected from the group consisting of $N(CH_2OH)_4$, $N(C_2H_4OH)_4$, $N(C_3H_4OH)_3$ and $C(NH_3)_2NH$, and x is a positive number not less than 0.5, and (B) 70 to 20 weight percent of vinyl polymer emulsion which is the emulsion polymerization product of polymerizable vinyl monomer using, as an emulsifying agent, a neutralized product of water-soluble resin containing carboxyl groups and having an acid value of 20–350 in an amount such that the theoretical acid value relative to the total solids contained in the resultant vinyl polymer emulsion is about 5–150.

3,933,707

DYEABLE POLYMERS OF ALPHA-OLEFINS CONTAINING A NICKEL SALT AND A TEREPHTHALIC ESTER

Ronald D. Mathis, Mauldin, S.C.; John H. Underwood, Charlotte, N.C., and James S. Dix, Taylors, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1971, Ser. No. 123,384

Int. Cl.² C08K *3/10, 5/12*

U.S. Cl. 260—23 H 12 Claims

1. A dyeable α-olefin polymer composition comprising an α-olefin polymer, a nickel compound selected from the class consisting of nickel salts of aliphatic organic acids, and a di-ester of terephthalic acid, said nickel compound being present in an amount of from 0.05 to 5.0 parts per 100 parts by weight of said α-olefin polymer, and said di-ester being present in an amount of from 0.1 to 4.0 parts per 100 parts by weight of said α-olefin polymer.

3,933,708

CRAYON WAX COMPOSITION

Robert B. Brinkman, Farmington, Mich., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 24, 1973, Ser. No. 363,781

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 H 5 Claims

1. An improved crayon wax composition containing a base wax, stearic acid, and a pigment wherein the improvement consists essentially of an additive mixture of:

a. polyethylene having a molecular weight of about 500,000–6,000,000 wherein the polyethylene is in the amount of about 0.10%–10% by weight of the total composition; and

b. paraffin wax having a melting point of about 120°F–140°F.

3,933,709

PROCESSING AIDS FOR POLY(VINYL CHLORIDE) RESINS

Erwin Aron, Clifton, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

Division of Ser. No. 407,033, Oct. 16, 1973, Pat. No. 3,856,547. This application June 17, 1974, Ser. No. 480,041

Int. Cl.² C08L *23/04, 23/12, 27/06, 91/00*

U.S. Cl. 260—23 XA 9 Claims

1. An improved method for processing a synthetic thermoplastic resin which is the product of the addition polymerization of an olefinically unsaturated monomer wherein particulate resin is admixed with a primary plasticizer and the resulting mixture is fabricated into a finished article, wherein the improvement comprises mixing said resin and primary plasticizer with a composition having as essential ingredients

a. at least about 50 weight percent of at least one monoalkyl phenoxy polyethylene glycol having from about 8 to about 12 carbons in the alkyl group thereof and from about 3 to about 7 ethyleneoxy units;

b. a minor proportion up to about 25 weight percent of at least one amine or ammonium salt of an organic acid having a vapor pressure of not greater than 1 mm Hg at 20°C selected from the group consisting of monoamine salts of monohydric organic acids of molecular weight of at least 136 and polyethylene polyamide salts of such acids where said polyethylene polyamide has at least 4 ethyleneamine units, there being one acid residue for each amine nitrogen of said polyalkylene polyamine; and

c. a minor proportion up to about 25 weight percent of at least one amide having a vapor pressure of not greater than about 1 mm Hg at 20°C selected from the group consisting of N-lower alkyl and N-hydroxy lower alkyl substitued higher amides of from 11 to about 24 carbons and amides of monohydric organic acids of molecular weight of at least 136 and polyethylene polyamines having at least 4 ethyleneamine units, there being one acid residue for each amine nitrogen,

said composition being present in an amount of from about 1 to about 10 weight percent, based upon said resin, so as to improve the flow and shear characteristics of said resin during fabrication thereof, and said primary plasticizer being present in an amount of at least 1 weight percent.

3,933,710

ASPHALT COMPOSITION

Naobumi Fukushi, Tokyo; Hideaki Nakazawa, Yokohama; Junichi Soshizaki, Tokyo, and Tetsuo Iikuni, Yokohama, all of Japan, assignors to Toyo Sodo Manufacturing Co., Ltd., Japan

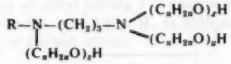
Filed June 26, 1974, Ser. No. 483,398

Claims priority, application Japan, June 29, 1973, 48-73446

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AS 9 Claims

1. A latex-asphalt emulsion composition which comprises a cationic latex prepared by emulsion-polymerizing a diene in the presence of an emulsifier of an inorganic or organic acid salt of an N-alkylpropylene diaminepolyglycol ether having the formula



wherein R represents a C_{12-20} saturated or unsaturated aliphatic hydrocarbon radical, x, y and z represent 0 or an integer such that $0 < x + y + z \leq 3$, n represents the integers 2 or 3; an alumina sol, and asphalt or an asphalt emulsion.

3,933,711

FORMING SIZE OF AQUEOUS POLYVINYLACETATE

Donald L. Motsinger, Forest City; Charles E. Nalley, Shelby, and Joe B. Lovelace, Forest City, all of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 302,611, Oct. 31, 1972, abandoned. This application July 23, 1974, Ser. No. 491,730

Int. Cl.² C08L *31/04*

U.S. Cl. 260—29.6 MM 4 Claims

1. An aqueous sizing composition for glass fiber strand whose ingredients other than water consists essentially of: 70 to 90 percent by weight based on total weight of the size solution solids of a polyvinyl acetate film former; 4 to 7 percent by weight based on solids fatty acid amide lubricant; 3 to

6 percent by weight solids gamma-ethylene diamine propyl trialkoxy silane; and 2 to 6 percent by weight solids methacrylic acid chromic halide coupling agent; said sizing composition having been adjusted to a pH of about 6.2 to 6.4, and said composition having 7.0 to 7.5 percent by weight solids.

3,933,712

NOVEL ENCAPSULATING MATERIAL AND METHOD

John J. Vanaglash, Jr., Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 465,316, April 29, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,209

Int. Cl.² C08L *83/04;* **C08J** *3/00*

U.S. Cl. 260—29.1 SB **6 Claims**

1. The method of making an encapsulating material comprising the steps:

a. forming a mixture of organopolysiloxane polymer, a polydimethyl siloxane fluid diluent, sodium borate and a filler taken from the group consisting of:
   1. hollow glass beads,
   2. aluminum oxide,
   3. silica,
   4. calcium carbonate,
   5. glass fiber,

said mixture having a polymer to diluent ratio of about 1:0.2 to 1:1.5 by weight and having a polymer to filler ratio of about 1:1 by volume;

b. adding sufficient methyl hydrogen siloxane catalyst to substantially completely polymerize said polymer;

c. controlling the amount of sodium in said mixture and catalyst to a total sodium content of from about 125 ppm to about 300 ppm by weight of the total mixture and catalyst; and

d. curing said mixture for a time and at a temperature sufficient to substantially completely polymerize said polymer.

3,933,713

METHOD FOR PREPARING AROMATIC POLYESTERS

Lev Borisovich Sokolov, ulitsa Truda, 18, kv. 35, and Tatyana Vladimirovna Kudim, ulitsa Feigina, 16, kv. 10, both of Vladimir, U.S.S.R.

Filed Sept. 24, 1974, Ser. No. 508,914

Int. Cl.² C08G *63/40;* **C08L** *67/02*

U.S. Cl. 260—29.2 E **3 Claims**

1. A method for preparing aromatic polyesters consisting in the interaction between bis-phenols and dihalogenanhydrides of aromatic dicarboxylic acids taken at the molar ratio from 0.9 to 1.1, at a temperature from −10° to +30°C, in the presence of alkali taken in the quantity of 2 – 2.5 mole per mole of bis-phenols, in the system water-organic liquid at their molar ratio from 0.2 to 5; said organic liquid is capable of dissolving dihalogenanhydrides of dicarboxylic acids, is chemically inactive towards the starting components, and is miscible with water in the quantity not less than 25 per cent; the said starting components are reacted in the presence of water-soluble salts of metals selected from the first and second groups of the Periodic System and taken in the quantity from 5 to 45 per cent by weight with respect to the quantity of water; as a result a reaction mixture containing the end product is obtained.

3,933,714

DIP FORMULATION ADDITIVE FOR PROTECTION OF ADHESIVE-COATED FABRICS AND SINGLE END CORDS

Hansford Tyson Adams, Leesville, S.C., assignor to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 385,200, Aug. 2, 1973, Pat. No. 3,876,457. This application Oct. 21, 1974, Ser. No. 539,357

Int. Cl.² C08L *61/12, 9/08*

U.S. Cl. 260—29.3 **3 Claims**

1. An adhesive dip formulation for application to fabric or single end cord made from a polyamide, polyester or rayon cord which is subsequently to be adhered to rubber in vulcanized shaped rubber articles comprises a dip of a resorcinol-formaldehyde condensate and a latex of vinyl pyridine-butadiene-styrene rubbery terpolymer or butadiene-styrene rubbery copolymer and from about 1 to about 10 weight percent of N,N′-ethylene bis-stearamide, based on the dry weight of rubber in resin-rubber mixture.

3,933,715

N-SUBSTITUTED MALEIC IMIDE PRESERVATIVE FOR AQUEOUS DISPERSIONS OF POLYMERS DERIVED FROM α, β-ETHYLENICALLY UNSATURATED MONOMERS

Franz Botsch, Burgkirchen, Alz; Helmut Braun, Hofheim, Taunus; Walter Fink, Frankfurt am Main; Friedrich Heller, Burghausen, and Karl Heinz Wallhausser, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

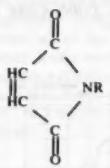
Filed Feb. 12, 1973, Ser. No. 331,856

Claims priority, application Germany, Feb. 16, 1972, 2207199

Int. Cl.² C08L *25/14, 35/06;* **C09D** *5/14*

U.S. Cl. 260—29.6 MN **12 Claims**

1. A preserved aqueous synthetic resin dispersion which comprises a polymer or copolymer of α,β-ethylenically unsaturated monomers and from 0.05 to 1.0 weight %, relative to the dispersion, of at least one N-substituted maleic imide derivative of the formula (I)



where R is an alkyl, cycloalkyl or aryl radical having from 3 to 8 carbon atoms, a 2-chloroethyl radical, a 4-nitrophenyl radical or a 2-naphthyl radical.

3,933,716

AQUEOUS DISPERSIONS OF VINYLESTER/ETHYLENE/ETHYLENICALLY UNSATURATED SULFONIC ACID OR DERIVATIVE THEREOF COPOLYMERS

Dieter Kuhlmann, Cologne, and Herbert Bartl, Odenthal-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 9, 1973, Ser. No. 404,664

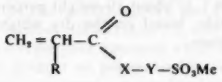
Claims priority, application Germany, Oct. 14, 1972, 2250517

Int. Cl.² C08L *41/00*

U.S. Cl. 260—29.6 TA **3 Claims**

1. The composition consisting essentially of a storage stable aqueous copolymer dispersion having a solids content of from 45 to 65% by weight and prepared by the process consisting essentially of continuously introducing ethylene, a vinyl ester selected from the group consisting of vinyl acetate, vinyl propionate, vinyl laurate, vinyl stearate and mixtures thereof

and an aqueous phase in a ratio by weight of vinyl ester to ethylene of from 100:2 to 100:250 and a weight ratio of vinyl ester to aqueous phase of from 3:1 to 0.3:1, into a reaction zone maintained at a temperature of from 0° to 90°C. and under an ethylene pressure of from 5 to 120 atmospheres and at a pH of from 3 to 7 for an average residence time of from 3 to 12 hrs. and continuously removing said aqueous copolymer dispersion together with unreacted monomers from said reaction zone, said aqueous phase containing a catalytic amount of a free radical catalyst and from 0.3 to 3% by weight, based on the weight of water in said aqueous phase, of an anionic emulsifier and from 0.1 to 15% by weight, based on the weight of water in said aqueous phase, of a compound of the formula



wherein R is hydrogen or methyl, X is —O—, —NH— or

having 1 to 6 carbon atoms, Y is ethylene having 2 to 10 carbon atoms and Me is an ammonium or alkali metal radical.

3,933,717

WATER SOLUBLE LINEAR MACROAMINE POLYMERS AND METHOD OF PRODUCING THEM

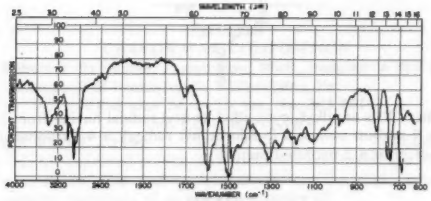
Isao Shinohara, and Juro Aoyagi, both of Tokyo, Japan, assignors to B. R. Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 323,731, Jan. 18, 1973, abandoned, Continuation-in-part of Ser. No. 345,122, March 26, 1973, abandoned. This application June 17, 1974, Ser. No. 479,631

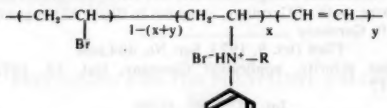
Claims priority, application Japan, Jan. 25, 1972, 47-8729; Mar. 28, 1972, 47-30334

Int. Cl.² C08L *23/00*; **C08F** *114/02*, *114/16*

U.S. Cl. 260—29.6 R **13 Claims**



1. A water soluble linear macroamine polymer consisting essentially of a structural unit shown by the following formula:



wherein R represents alkyl group containing 1 to 4 carbon atoms, *x* is a mol decimal fraction between about 0.65 and 0.95, and *y* is a mol decimal fraction between about 0.23 and 0.04.

3,933,718

LOW VISCOSITY EMBEDDING MEDIUM

Arthur R. Spurr, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 208,926, Dec. 16, 1971, abandoned, which is a continuation of Ser. No. 2,386, Jan. 12, 1970, abandoned. This application Apr. 23, 1974, Ser. No. 463,318

Int. Cl.² C08K *5/15*

U.S. Cl. 260—30.4 EP **6 Claims**

1. In an embedding medium for infusing the cells of biological specimens, polymerizable to a hard, tough, transparent polymer without disruption of said cells, the improvement comprising employing in said medium about 10 parts by weight of a polymerizable cycloaliphatic diepoxide having a viscosity of less than about 8 centipoise at 25° C., about 4 to 8 parts by weight of an epoxy resin flexibilizer product, derived from the condensation of a polypropylene glycol having a degree of polymerization of from about 2 to 6 with epichlorohydrin, and having a viscosity of less than about 60 centipoises at 25° C., about 26 parts by weight of an anhydride hardener having a viscosity of less than about 120 centipoises at 25° C., and about 0.2 to 1.0 parts by weight of an alkyl alkanol amine accelerator having a viscosity of less than about 4 centipoises at 25° C.

3,933,719

POLYCHLOROPRENE-BASE ADHESIVE COMPOSITION

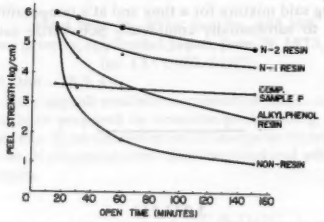
Sakuya Iwai, Tokyo, and Takao Hirose, Kamakura, both of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed Mar. 1, 1974, Ser. No. 447,160

Claims priority, application Japan, Mar. 7, 1973, 48-26738

Int. Cl.² C08K *5/01*, *5/02*, *5/10*

U.S. Cl. 260—31.2 MR **8 Claims**



1. A polychloroprene-base adhesive composition which consists of:

1. from 1 to 70 parts by weight of a resinous material containing indene and having a softening point of 145°C. or higher which is obtained by polymerizing a cracked fraction produced as a by-product of thermal or catalytic cracking of crude petroleum or petroleum distillates;
2. 100 parts by weight of a polychloroprene;
3. from 1 to 40 parts by weight of a metallic oxide selected from the group consisting of zinc oxide and an alkaline earth metal oxide;
4. 0 to 5 parts by weight of an antioxidant;
5. 0 to 70 parts by weight of an alkylphenol resin, coumarone-indene resin, terpenephenol resin or polyterpene resin; and
6. A volatile organic solvent selected from the group consisting of an aromatic hydrocarbon, a chlorinated aliphatic hydrocarbon, a lower alkyl ester of acetic acid, a saturated aliphatic hydrocarbon and mixtures thereof.

3,933,720
POLYCHLOROPRENE TYPE ADHESIVE COMPOSITIONS

Sakuya Iwai, Tokyo, and Takao Hirose, Kamakura, both of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed Apr. 2, 1974, Ser. No. 457,276
Claims priority, application Japan, Apr. 7, 1973, 48-39146
Int. Cl.² C08K 5/01, 5/02, 5/09
U.S. Cl. 260—31.2 MR 10 Claims

1. An adhesive composition comprising, by weight, (1) 1–100 parts of an acid-modified hydrocarbon resin selected from the group consisting of aliphatic hydrocarbon resins, aromatic hydrocarbon resins, and mixtures thereof, (2) 100 parts of polychloroprene, (3) 1–40 parts of a metal oxide and 0–5 parts of an anti-aging agent, (4) 0–100 parts of at least one supplemental resin, and (5) 100–1000 parts of a volatile organic solvent, the acid-modified resin (1) having been prepared by reacting 100 parts of a starting hydrocarbon resin having a softening point of about 100° to about 157°C, obtained by the polymerization of a cracked petroleum oil fraction selected from the group consisting of a fraction boiling at 20°–140°C, a fraction boiling at 140°–280°C, and mixtures thereof, with 0.1–30 parts of an unsaturated polybasic acid material selected from the group consisting of unsaturated polybasic acids and anhydrides thereof.

3,933,721
FLAME RETARDANT PLASTICIZED COMPOSITIONS

Alfred P. Wilson, St. Charles, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Oct. 23, 1973, Ser. No. 408,804
Int. Cl.² C07C 69/82; C08K 5/12; C08L 27/08
U.S. Cl. 260—31.8 HA 7 Claims

1. A composition comprising a resinous polymer of vinyl chloride, wherein at least 50 mol percent of the polymer contains vinyl chloride units, and a plasticizing concentration of a dialkyl 2,5-dibromoterephthalate ester containing from 4 to 24 carbon atoms in each alkyl group.

3,933,722
MEET EXTRUDABLE POLYACETYLENE COPOLYMER BLENDS

Charles M. Krutchen, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 352,923, April 20, 1973, Pat. No. 3,852,235, which is a continuation-in-part of Ser. No. 86,280, Nov. 2, 1970, abandoned. This application Aug. 15, 1974, Ser. No. 497,526
Int. Cl.² C08F 45/28, 19/20; C01B 31/07
U.S. Cl. 260—32.4 4 Claims

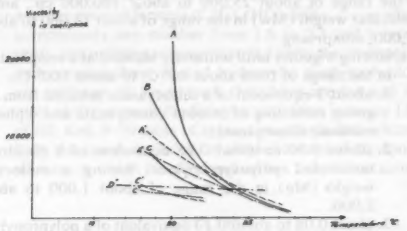
1. Polyacetylene blends which are melt extrudable at temperatures of from 100°C to 180°C, comprising by weight (A) from 20% to 50% by weight polyacetylene having an intrinsic viscosity of 0.5 to 1.5 in orthodichlorobenzene at 120°C, and (B) from 80 to 50% of organic solvent selected from the class consisting of paradichlorobenzene, ortho-dichlorobenzene, nitrobenzene, and halogenated aryl hydrocarbons having an average weight percent of chlorine from about 12 to 75% based on the total weight of halogen, carbon and hydrogen where said blends can be in the form of a free flowing powder, a wet granulated mixture, or paste and where the polyacetylene is a terpolymer consisting essentially of

i. 74 to 86 mole percent of meta-diethynylbenzene units,
ii. 4 to 9 mole percent of para-diethynylbenzene units,
iii. 5 to 15 mole percent of diethynylalkane units, where the sum of (i), (ii) and (iii) units are 100 mole percent.

3,933,723
SYNTHETIC RUBBER SOLUTIONS

Torbjorn Grenness, 24, Danas Plads, Copenhagen, Denmark

Continuation of Ser. No. 376,583, July 5, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,727
Claims priority, application United Kingdom, July 5, 1972, 31498/72
Int. Cl.² C08K 5/01
U.S. Cl. 260—33.6 A 2 Claims



1. A solution for the production of rubber-like articles by dipping, comprising an elastomer of the block-copolymer type selected from the group consisting of styrene-butadiene copolymer and styrene-isoprene copolymer, chosen from the thermoplastic rubbers which do not need vulcanization, extended with 15 to 35% by weight of a naphthenic oil extender, the extended block-copolymer being dissolved in 200 to 1200% by weight of petrol, all of the percentages being per 100 parts of said elastomer, and a member selected from the group consisting of zinc dibutyl-dithiocarbamate and 1,3,5-trimethyl-2,4,6-tris-(3,5-di-tert.-butyl-4-hydroxy-benzyl)-benzene at a ratio of about 0.1 to 3.0 parts by weight per 100 parts by weight of said elastomer.

3,933,724
SEALING COMPOUNDS

Ronald G. Mixell, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 99,529, Dec. 18, 1970, abandoned. This application Dec. 4, 1974, Ser. No. 529,446
Int. Cl.² C08K 5/01; C08L 9/06, 45/02
U.S. Cl. 260—33.6 A 14 Claims

1. A can end sealant composition for food containers which imparts substantially no odor or taste to food packaged in said container consisting essentially of from 80 to 100 parts by weight of styrenebutadiene rubber with from about 20% to 25% bound styrene; from about 50 to 80 parts by weight of a resin selected from the group consisting of a coumarone-indene type resin and a polycyclopentadiene, said resin having a melting point from about 100°C. to 145°C, the total amount of said styrene-butadiene rubber and said resin being not more than 160 parts by weight of said composition; from about 45–75 parts by weight of a filler having an average particle size of about 10 microns and being selected from the group consisting of silica and clay; and about 2 to 5 parts by weight of charcoal to protect against taste and odor transfer to food packaged in said container.

3,933,725
PREPARATION OF ISOCYANATE TERMINATED PREPOLYMER

Thomas J. Dearlove, Troy; Gregory A. Campbell, Romeo, and Richard P. Atkins, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 26, 1974, Ser. No. 509,638
Int. Cl.² C08G 18/08; C08K 5/01
U.S. Cl. 260—33.6 UB **5 Claims**

1. An improved process of forming a partially crosslinked, plasticized, polyurethane moisture curable sealant prepolymer having an isocyanate to hydroxyl equivalent ratio in the range of about 1.4:1 to about 1.5:1, a free isocyanate content in the range of about 1.2% to about 1.8% by weight based on the total prepolymer composition, a Brookfield viscosity at 25° C. in the range of about 25,000 to about 100,000 cp., and a molecular weight (Mw) in the range of about 15,000 to about 25,000, comprising:

a. stirring together until uniformly blended at a temperature in the range of from about 40° C. to about 100° C.:
   1. about 1 equivalent of a diisocyanate selected from the group consisting of toluene diisocyanate and diphenyl methane diisocyanate,
   2. about 0.50 to about 0.55 equivalent of a dihydroxy terminated polyoxypropylene, having a molecular weight (Mn) in the range of about 1,000 to about 2,000,
   3. about 0.08 to about 0.13 equivalent of a polypropylene ether triol, having a molecular weight (Mn) in the range of from about 1,500 to about 4,500, and
   4. about 5% to 15% by weight based on the total composition of a plasticizer that is miscible and compatible with said diisocyanate and said polyols, until a solution is achieved, and then as said solution is being stirred,

b. catalyzing the polymerization reaction of said diisocyanate and said polyols to form said prepolymer by mixing into said solution a solution comprising from about 0.08 to about 0.12 weight parts per each 250 weight parts of said diisocyanate of a tin-based urethane polymerization catalyst dissolved in about 5% to about 10% by weight based on the total composition of additional plasticizer, and

c. continuing to stir said reacting mixture for a period of minutes to maintain a relatively uniform distribution of reacting species until the free isocyanate content of said solution is within the range of from about 1.2% to about 1.8% by weight based on the total composition, thereby forming said prepolymer substantially free of gel particles.

3,933,726
HEAT VULCANIZABLE POLYSILOXANE COMPOSITIONS CONTAINING ASBESTOS

Frank J. Glaister, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

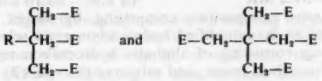
Continuation of Ser. No. 134,438, April 15, 1971, Pat. No. 3,715,329. This application Aug. 28, 1972, Ser. No. 284,121
Int. Cl.² C08L 83/04
U.S. Cl. 260—37 SB **9 Claims**

1. A process for forming a cured silicone rubber with exceptionally high tensile strength comprising mixing an organopolysiloxane polymer having a viscosity of at least 100,000 centipoise at 25°C of the formula,

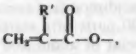
$$(R)_nSiO \qquad (1)$$

with an asbestos fiber, a peroxide curing catalyst and an acrylic ester selected from the group consisting of

$$E{-}R,\quad E{-}R^2{-}E,\quad E(C_xH_{2x}O)_z{-}R^2{-}O{-}E,$$



where E represents the radical



where at least 50% by weight of the R radicals in Formula (1) are alkyl and at least 0.1% by weight of the R radicals in Formula (1) are alkenyl and the remaining R radicals in Formula (1) may be selected from the class consisting of aryl, aralkyl, cycloalkyl and cyanoalkyl, where the R radicals in the acrylic ester formulas are lower alkyl, where R′ is selected from the class consisting of alkyl, aryl, alkenyl, cycloalkyl and hydrogen, R^2 is a divalent hydrocarbon radical, a varies from 1.95 to 2.01, inclusive, n is a whole number that varies from 2 to 4 and x varies from 1 to 10, and heating the resulting mixtuure to a temperature in the range of 80° to 650°C.

3,933,727
METHOD OF PRODUCING POLYURETHANE-BASED CORES AND MOULDS ACCORDING TO THE SO-CALLED COLD-BOX PROCEDURE

Hermann Pius Schmid, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Sept. 13, 1973, Ser. No. 397,186
Claims priority, application Sweden, Sept. 26, 1972, 12377/72
Int. Cl.² C08G 18/28
U.S. Cl. 260—37 N **3 Claims**

1. In a method for producing "cold-box" polyurethane cores and molds which are useful for the casting of iron, steel or light metals, the improvement which comprises:

admixing sand with a bonding agent, wherein said bonding agent comprises the combination of a polyisocyanate with at least two and up to six isocyanate groups per molecule and a polyhydroxy compound, wherein said polyhydroxy compound consists of at least one aliphatic or aromatic polyether-polyol in combination with 5 – 50 percent by weight as calculated on the amount of polyether of an aromatic hydroxy compound for initiating the catalyzation, said hydroxy compound having at least 2 OH-groups which directly or via one methylene group are linked to a carbon atom in the aromatic nucleus, said polyether-polyol consisting of one or more polyadducts of ethylene oxide, propylene oxide or tetrahydrofuran, respectively, to an aliphatic diamine or an aliphatic or aromatic polyol with 2 – 6 hydroxy groups per molecule, and wherein the ratio between the polyisocyanate compound and the polyhydroxy compound corresponds to an NCO/OH ratio of 0.8 – 3.0, said polyadducts having a molecular weight of approximately 100 – 10,000, afterwhich the mixture is given the form desired and is hardened by means of a polyurethane catalyst.

3,933,728

MOULDING COMPOSITION

Richard George Cleveland Henbest, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 13, 1974, Ser. No. 469,664

Claims priority, application United Kingdom, May 15, 1973, 23044/73

Int. Cl.² C08L *75/06, 75/04*

U.S. Cl. 260—37 N **30 Claims**

1. A moulding composition which is formed by partially reacting a fluid mixture comprising

a. from 10% to 90% by weight of polyurethane precursors comprising at least one polyfunctional compound containing at least two isocyanate-reactive groups, at least one polyisocyanate, and at least one ethylenically unsaturated compound containing at least one group reactive with the polyfunctional compound and/or with the polyisocyanate, the ethylenically unsaturated compound being copolymerisable with the ethylenically unsaturated monomer in (b) and having a molecluar weight of not greater than 750, and;

b. from 90% to 10% by weight of polyester resin precursors comprising at least one ethylenically unsaturated polyester and at least one ethylenically unsaturated monomer copolymerisable therewith, in the mixture

the polyfunctional compound, the polyisocyanate and the ethylenically unsaturated compound being reacted with each other, the ethylenically unsaturated monomer being substantially uncopolymerised with the ethylenically unsaturated compound and with ethylenically unsaturated polyester, wherein the ethylenically unsaturated compound of (a) is different from said ethylenically unsaturated monomer of said polyester precursor, in which the molar proportion of isocyanate groups in the diisocyanate to groups reactive with isocyanate groups in the polyfunctional compound plus ethylenically unsaturated polyester is in the range 0.8:1 to 1.2:1 and in which the amount of the ethylenically unsaturated compound in the polyurethane precursors is such that the number of equivalents of ethylenic unsaturation provided by the compound to the number of moles of polyurethane precursors is in the range 0.1 to 0.6.

3,933,729

ORGANOPOLYSILOXANE COMPOSITIONS WHICH VULCANISE AT AMBIENT TEMPERATURE AND ABOVE TO YIELD ELASTOMERS WHICH ADHERE TO THE MOST DIVERSE SUPPORTS

Michel Letoffé, Ste-Foy-les-Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 10, 1974, Ser. No. 468,871

Claims priority, application France, May 11, 1973, 73.17157

Int. Cl.² C08L *83/00*

U.S. Cl. 260—37 SB **6 Claims**

1. An organopolysiloxane composition vulcanisable at ambient temperature and above, comprising in parts by weight:

A. 100 parts of an α,ω-dihydroxydiorganopolysiloxane polymer, of viscosity 500 cPo at 25°C to 1 million cPo at 25°C, in which the organic radicals bonded to the silicon atoms, which may be the same or different, each is an alkyl radical with 1 to 3 carbon atoms, a hologenoalkyl radical with 3 or 4 carbon atoms, a vinyl radical, an aryl radical with 6 to 8 carbon atoms, a halogenoaryl radical with 6 or 7 carbon atoms or a cyanoalkyl radical with 3 or 4 carbon atoms; at least 60% of these organic radicals being methyl radicals;

B. 10 to 50 parts of a methylpolysiloxane resin consisting of units of the formulae $R(CH_3)_2SiO_{0.5}$ and units of formula SiO_2, wherein R represents an alkyl radical with 1 to 3 carbon atoms or a vinyl radical, and the value of the ratio of the number of $R(CH_3)_2SiO_{0.5}$ units to the number of SiO_2 units is 0.4:1 to 1.2:1, these polymers containing at least 0.5% but not more than 3.5% by weight of hydroxyl groups bonded to the silicon atoms,

C. 10 to 70 parts of a filler;

D. 0.5 to 15 parts of an aminoorganosilicon compound which is an aminoorganosilane of the formula (i) $(R''O)_{3-p}R'_pSi[(CH_2)_nO]_m(CH_2)_lNHQ$ in which R' represents an alkyl group with 1 to 4 carbon atoms, a vinyl group or a phenyl group, R'' represents a methyl, ethyl or methoxyethyl radical, Q represents a hydrogen atom or the radical $-(CH_2)_2NH_2$, p and m represent 0 or 1, n represents 1, 2, 3 or 4, and t represents 2 or 3, or an aminoorganopolysiloxane produced by reacting the aminoorganosilane (i) above, in which p is 0, with a hydroxylic methylpolysiloxane polymer (ii) containing at least 2% by weight of hydroxyl groups bonded to the silicon atoms, or viscosity 1 cPo at 25°C to 1,000 cPo at 25°C, of the average general formula $(CH_3)_a(HO)_bSiO_{(4-a-b)}$ in which a represents any number from 1.6 to 2.3 and b represents any number ranging from 0.1 to 1; the amounts of aminoorganosilane (i) and hydroxylic methylpolysiloxane polymer (ii) being such that there are 0.4 and 1.2 mols of (i) per gram-(hydroxyl group) (that is to say 17g) of (ii); and, 0–10 parts of at least one compound selected from the group consisting of alkylsilicates and alkylpolysilicates in which the alkyl radical has 1–3 carbon atoms.

3,933,730

THERMALLY STABLE TRANSLUCENT POLYCARBONATE COMPOSITION

Thomas J. Hoogeboom, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 9, 1974, Ser. No. 496,129

Int. Cl.² C08L *69/00*

U.S. Cl. 260—37 PC **3 Claims**

1. A thermally stable translucent polycarbonate composition comprising in admixture, an aromatic carbonate polymer and from 0.01 to about 5.0 weight percent based on the weight of the polycarbonate composition of a mixture of a poly(dimethylsiloxane) gum and finely divided silica having a surface area in the range of 50 to 380 cm^2/g; wherein the mixture of poly(dimethylsiloxane) gum and finely divided silica is present in a ratio of from about 30 to about 120 parts of the silica to 100 parts of the poly(dimethylsiloxane) gum.

3,933,731

PLASTIC COMPOSITION LIBERATING REDUCED AMOUNTS OF TOXIC GAS

Sueo Machi, Takasaki; Yasushi Matui, Satte; Takayuki Shinano, Yokohama; Taiji Aono, Ichihara; Yoshiharu Hibi, Yokohama; Shozo Oshima, Iwatsuki, and Masayuki Kashiki, Soka, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo; Maruzen Oil Co. Ltd., Osaka and Mitsubishi Kakoki Kaisha Ltd., Tokyo, all of, Japan

Filed Sept. 5, 1973, Ser. No. 394,419

Claims priority, application Japan, Sept. 5, 1972, 47-88338

Int. Cl.² C08L *67/00;* **C08K** *3/06*

U.S. Cl. 260—40 R **5 Claims**

1. A composite comprising (1) from about 2 to about 50 parts by weight of a plastic material selected from the group consisting of thermoplastic resins and thermosetting resins, and (2) from about 50 to about 98 parts by weight of a filler composition comprising (i) gypsum and/or calcium sulfite and (ii) an additive of calcium hydroxide in an amount of from about 0.5 to about 60% by weight based on the total weight of said filler composition, characterized in that said composite is improved in that, due to the presence of said additive it emits very little or substantially no sulfur dioxide when it is burned, and also emits very little or substantially no hydrogen sulfide when the ash of said composite remaining after combustion thereof is contacted with water, in spite of the fact that like composites of the prior art usually emit toxic gases when burned or when their ash is contacted with water.

3,933,732
FLUOROELASTOMER COMPOSITION AND CURING PROCESS

Walter Werner Schmiegel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 294,794, Sept. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,669, Dec. 27, 1971, abandoned. This application May 14, 1974, Ser. No. 469,840

Int. Cl.² C08F *27/06, 29/16*

U.S. Cl. 260—42.27 **12 Claims**

1. A fluoroelastomer composition comprising (A) an elastomeric copolymer of vinylidene fluoride and at least one other fluorine-containing monomer, and (B) as a vulcanization agent, a carboxylic acid ester of 4,4′-sulfonyldiphenol in which 25–100% of the equivalents of hydroxyl groups of said diphenol have been converted to carboxylic acid ester groups, said carboxylic acid being selected from the group: aliphatic and aromatic carboxylic acids having up to 26 carbon atoms.

3,933,733
PHOSPHITE STABILIZED POLYVINYL CHLORIDE CONTAINING RESINS

Osamu Kimura, Toyonaka; Katsuhiro Mukai, Oita; Minoru Osada, Sagamihara; Shizuo Nara, Kamifukuoka; Yoshitaka Tanaka, Sagamihara, and Masuo Yukitomi, Fuchu, all of Japan, assignors to Kyodo Chemical Company, Limited, Tokyo and Sumitomo Chemical Company, Limited, Osaka, both of, Japan

Continuation-in-part of Ser. No. 307,634, Nov. 17, 1972, abandoned. This application May 9, 1974, Ser. No. 468,586

Claims priority, application Japan, Nov. 18, 1971, 46-92524

Int. Cl.² C08K *5/52*

U.S. Cl. 260—45.7 PH **7 Claims**

1. A composition consisting essentially of a polyvinyl chloride containing resin composition, stabilized with a stabilizing amount of a phosphite selected from the group consisting of 2-(n-butoxy)-ethyldiphenyl phosphite, 4-methoxybutyldiphenyl phosphite, 2-(n-butoxydiethylenoxy)ethyldiphenyl phosphite, 3-(2-ethyl-hexyloxy) propyldiphenyl phosphite, 2-oleyloxyethyldiphenyl phosphite, 2-ricinoleyloxyethyldiphenyl phosphite, 2-benzyloxyethyldiphenyl phosphite, octyl di(2-butoxyethyl)phosphite, 2-(2-butoxyethoxy)ethyldiphenyl phosphite, 2-butoxyethyl p-chlorophenyloleyl phosphite and 2-isopropylbenzyloxyethyldiphenyl phosphite.

3,933,734
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, and Thomas J. Hoogeboom, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,643

Int. Cl.² C08K *5/42*

U.S. Cl. 260—45.7 S **8 Claims**

1. A flame retardant carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a metal salt of a monomeric aromatic sulfonic acid or mixtures thereof, wherein said metal salts thereof are selected from the group consisting of the alkali metal salts and the alkali earth metal salts and mixtures thereof.

3,933,735
4-PIPERIDONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS STABILIZERS

Keisuke Murayama; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayu Ohsawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Japan

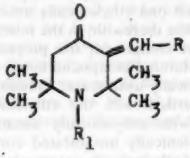
Division of Ser. No. 325,742, Jan. 22, 1973. This application May 15, 1974, Ser. No. 470,309

Claims priority, application Japan, Jan. 26, 1972, 47-9670; Feb. 22, 1972, 47-18346

Int. Cl.² C08K *5/00*

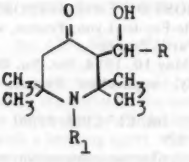
U.S. Cl. 260—45.8 N **7 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound selected from the group consisting of the 4-piperidone derivatives having the formulae



(I)

and



(II)

wherein R represents a phenyl or naphthyl group which may be substituted with nitro, lower alkyl, halogen, hydroxy, lower alkyl hydroxy, hydroxy lower alkyl or formyl or a 5— or 6—membered heterocyclic group having as a hetero atom a member selected from the group consisting of oxygen, sulfur and nitrogen and R_1 represents hydrogen atom or an alkyl group of 1 to 4 carbon atoms.

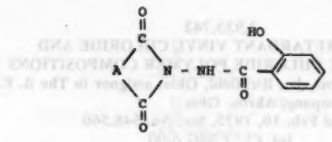
3,933,736

POLYOLEFIN COMPOSITION

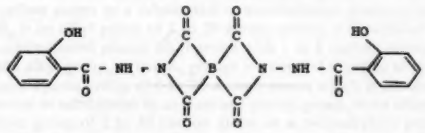
Toshio Yoshikawa; Nagayoshi Sakamoto, and Tomitada Nagamori, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Aug. 14, 1974, Ser. No. 497,302
Claims priority, application Japan, Feb. 26, 1974, 49-21945
Int. Cl.² C08L *23/00*
U.S. Cl. 260—45.8 R 19 Claims

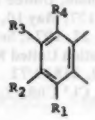
1. A polyolefin composition which comprises 100 weight parts of a polyolefin selected from the class consisting of homopolymers and copolymers of ethylene, propylene, butene-1, isobutene, pentene-1 and 4-methylpentene-1, copolymers of these olefins and ethyl acrylate, copolymers of these olefins and vinyl acetate, mixtures of these polymers, liquid amorphous polypropylene and liquid amorphous polybutene, and 0.001 ~5 weight parts of N-(salicyloylamino)imide represented by the formula



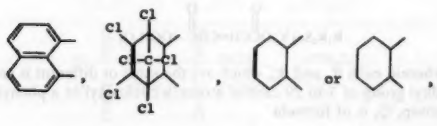
or



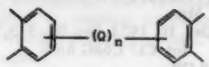
in which A represents a group



in which R_1 – R_4 represent hydrogen atoms, halogen atoms, nitro groups, amino groups, carboxyl groups, hydroxyl groups, phenyl groups, phenylthio groups, or straight or branched alkyl, halogenated alkyl, alkoxyl, alkylthio, alkylamino or acylamino groups each having 1 to 5 carbon atoms,



and B represents a group



in which Q represents an oxygen atom, a sulfur atom, a methylene group, a carbonyl group, a phenylene group, a phthaloyl group, an isophthaloyl group or a terephthaloyl group, and *n* is an integer of 0 or 1 or

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3,933,737

POLYMER COMPOSITION FOR BONDING TO COPPER

Fritz Glander, Isernhagen NB, and Bernd Eilhardt, Vinnhorst, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Division of Ser. No. 171,198, Aug. 12, 1971, Pat. No. 3,806,358. This application Apr. 22, 1974, Ser. No. 462,791
Claims priority, application Germany, Aug. 22, 1970, 2041785
Int. Cl.² C08G *6/00*
U.S. Cl. 260—45.9 NC 23 Claims

1. An improved composition for bonding to copper, comprising: a polymer selected from the group consisting of nonionic copolymers and ionic copolymers of ethylene and an α,β-monoethylenically unsaturated hydrocarbon carboxylic acid, said polymer including a copper deactivating amount of a copper stabilizer.

3,933,738

FLAME RETARDANT ADDUCT OF CYCLOPHOSPHONITRILIC CHLORIDE AND HEXAMETHYLPHOSPHORAMIDE

Robert M. Murch, Ashton, and Eldon E. Stahly, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 436,779, Jan. 25, 1974, abandoned. This application May 23, 1975, Ser. No. 580,451
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.9 NP 6 Claims

1. An epoxy resin having enhanced fire retardancy properties which comprises an epoxy resin and an additive selected from the class consisting of $(PNCl_2)_3$,$[(CH_3)_2N]_3PO$, $(PNCl_2)_3$,$[(CH_3)_2N]_3PO$, and mixtures thereof in a flame retardant amount.

3,933,739

N-ISOPROPYL-N'-5-METHYL-3-HEPTYL-P-PHENYLENEDIAMINE ANTIOZONANT FOR RUBBER

Gene Ray Wilder, Medina, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 10, 1974, Ser. No. 513,713
Int. Cl.² C08G 6/00
U.S. Cl. 260—45.9 QB 3 Claims

1. Vulcanizable diene rubber having incorporated therein a stabilizing amount of N-isopropyl-N'-5-methyl-3-heptyl-p-phenylenediamine.

3,933,740

HALOGEN CONTAINING POLYMERIC RESINS HAVING IMPROVED HEAT AND LIGHT STABILITY

George C. Hopkins, Clarence, and D. Bruce Merrifield, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,115
Int. Cl.² C08G 6/00
U.S. Cl. 260—45.75 W 5 Claims

1. A heat and light stable polymer composition comprising a vinyl polymer containing more than 5 weight percent halogen substituent and a stabilizing amount of a salt of a di- or trivalent metal selected from the group consisting of calcium, zinc, cadmium, barium, and tin, with the reaction product of an alpha-olefin of 3 to 60 carbon atoms and maleic anhydride or a mono-substituted maleic anhydride, wherein said reaction product is prepared from reaction of 1 to about 20 moles of said olefin per mole of said anhydride and the substituent of the substituted anhydride is alkyl or alkoxy.

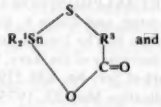
3,933,741

STABILIZED VINYL CHLORIDE POLYMER COMPOSITIONS

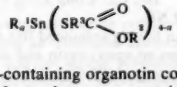
William A. Larkin, Morristown, and Robert C. Ringwood, Jr., Sewaren, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 290,994, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 732,027, May 27, 1968, abandoned. This application Sept. 17, 1974, Ser. No. 506,708
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.75 S 6 Claims

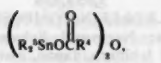
1. An improved two-component heat stabilizer for vinyl chloride polymers, said stabilizer consisting essentially of a sulfur-containing organotin compound and a non-sulfur-containing organotin compound, the weight ratio of the sulfur-containing compound to the non-sulfur-containing compound being between 4:1 and 1:4, respectively, wherein the sulfur-containing organotin compound exhibits a formula selected



and



and the non-sulfur-containing organotin compound exhibits a formula selected from the group consisting of $R_2^4R_2^5Sn$, $R_3^4R^5Sn$ and



wherein R^1 and R^2 are individually selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms, cycloalkyl, aryl, alkaryl and aralkyl radicals, R^3 is a methylene or ethylene radical, R^4 and R^5 are selected from the same group as R^1, with the proviso that R^4 and R^5 are not identical when both are bonded directly to a tin atom and a represents the integer 1 or 2.

3,933,742

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer D. Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 10, 1975, Ser. No. 548,560
Int. Cl.² C08G 6/00
U.S. Cl. 260—45.75 N 11 Claims

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiCO_3$ and nickel citrate and (B) ZnO, said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

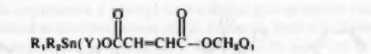
3,933,743

ORGANOTIN THERMAL STABILIZERS FOR PVC RESINS

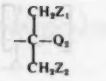
Harold Coates, Wombourne; John Desmond Collins, Albrighton, and Iftikhar Hussain Siddiqui, Birmingham, all of United Kingdom, assignors to Albright & Wilson Limited, Oldburg near Birmingham, United Kingdom

Division of Ser. No. 359,177, May 10, 1973, abandoned. This application July 22, 1974, Ser. No. 490,241
Claims priority, application United Kingdom, May 10, 1972, 21828/72; May 10, 1972, 21829/72
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.75 J 6 Claims

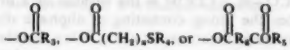
1. A stabilized polymer composition which comprises at least one resin containing at least 40% by weight of chlorine and selected from the group consisting of homopolymers of vinyl chloride and vinylidene chloride, post-chlorinated polyolefins and copolymers of vinyl chloride or vinylidene chloride with up to 25%, based on the weight of total monomers, of one or more copolymerizable monomers, and, as stabilizer therefor, 0.01 - 10% by weight (based on the weight of the resin) of an organotin compound of the formula



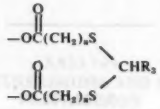
wherein each R_1 and R_2, which are the same or different is an alkyl group of 1 to 20 carbon atoms, a cycloalkyl or a phenyl group, Q_1 is of formula



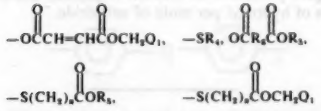
wherein Q_2 is hydrogen, an alkyl group of 1 to 6 carbon atoms, or CH_2Z_3, wherein Z_3 is as defined for Z_1 or Z_2 below, and each of Z_1 and Z_2, which are the same or different, is of formula



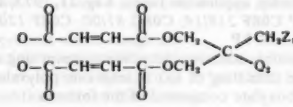
or a pair of radicals selected from the group consisting of Z_1, Z_2 and Z_3 forms a group of formula



wherein R_3 is an alkyl group of 1 to 20 carbon atoms, a substituted or unsubstituted phenyl group or an alkyl phenyl group, which is substituted or unsubstituted, or two R_3 groups form a single bond between two carbon atoms, an alkylene group of 1 to 20 carbon atoms, an alkenylene group of 2 to 20 carbon atoms or a substituted or unsubstituted phenyl group; R_4 is an alkyl group of 1 to 20 carbon atoms, a substituted or unsubstituted phenyl alkyl group with 1 to 6 carbon atoms in the alkyl group, or two R_4 groups are bonded together to form an alkylene group of 1 to 20 carbon atoms which is unsubstituted or substituted by at least one phenyl group, or an alkenylene group of 2 to 20 carbon atoms or a cycloalkylene group of 5 or 6 carbon atoms, R_5 is an alkyl group of 1 to 20 carbon atoms, a substituted or unsubstituted phenyl group or an alkylphenyl group which is substituted or unsubstituted, or two R_5 groups are bonded together to form an alkylene group of 1 to 20 carbon atoms, R_6 is a single bond, an alkenylene group of 1 to 20 carbon atoms or an alkenylene group of 2 to 20 carbon atoms, or a substituted or unsubstituted phenylene group, n is an integer of 1 to 6 and Y is of formula



or Y and the group -OCOCH=CH=COOCH$_2$Q$_1$ together form a group of formula



3,933,744

ESTERS AND MIXTURES THEREOF WITH ORGANOTIN COMPOUNDS USEFUL AS POLYMER STABILIZERS

Harold Coates, Wombourne; John Desmond Collins, Albrighton, and Iftikhar H. Siddiqui, Edgbaston, all of England, assignors to Albright & Wilson Limited, Oldbury near Birmingham, England

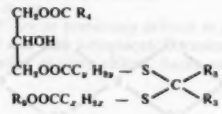
Division of Ser. No. 442,874, Feb. 15, 1974. This application June 16, 1975, Ser. No. 586,955

Claims priority, application United Kingdom, Feb. 19, 1973, 7984/73

Int. Cl.[2] C08J 3/20

U.S. Cl. 260—45.75 S 21 Claims

1. An ester of the general formula

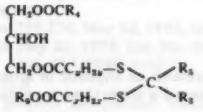


wherein,

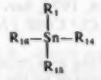
each of x and y, which are the same or different, is an integer of 1–6

each of R_4 and R_9, which are the same or different, is selected from the group consisting of alkyl groups of 1 to 21 carbon atoms, alkenyl groups of 2–21 carbon atoms, cycloalkyl groups, aromatic hydrocarbylgroups, aralkyl hydrocarbyl groups and aralkenyl hydrocarbyl groups, each of R_3 and R_8, which are the same or different, is as defined above for R_4 and R_9, or is hydrogen or R_3 and R_8, together with the carbon atom to which they are attached, forms a cycloalkyl ring.

21. A polymeric material which comprises a halogen-containing resin and, as stabilizer therefor a composition consisting of 1) an ester of the general formula



wherein each of *x* and *y*, which are the same or different, is an integer of 1–6, each of R_4 and R_9, which are the same or different, is selected from the group consisting of alkyl groups of 1 to 21 carbon atoms, alkenyl groups of 2–21 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups, aralkyl hydrocarbyl groups and aralkenyl hydrocarbyl groups, each of R_3 and R_8, which are the same or different, is as defined above for R_4 and R_9, or is hydrogen or R_3 and R_8, together with the carbon atom to which they are attached, forms a cycloalkyl ring, and 2) an organotin compound of the formula



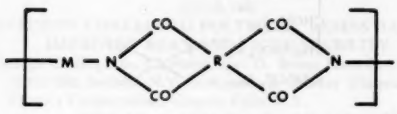
wherein R_1 is selected from the group consisting of alkyl groups of 1 to 12 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups or aralkyl hydrocarbyl groups, R_{14} is as defined for R_1 or each of R_{14}, R_{15} and R_{16}, which are the same or different, is selected from the group consisting of groups of formula $-OOCR_4$, $-OOCR_{17}COOR_9$, $-SC_xH_{2x}COOR_9$ and $-SR_4$, or R_{15} and R_{16} together is selected from the group consisting of groups of formula —S—, $-OOCR_{17}COO-$, and $-SC_xH_{2x}COO-$, or R_{15} and R_{16} together represent —S— and R_{14} represents —SH, wherein R_4, R_9 and x are as defined in claim 1 and R_{17} represents a group selected from the group consisting of alkylene, alkenylene, cycloalkylene and arylene groups.

3,933,745
IMIDE COPOLYMERS POSSESSING HYDROXYL GROUPS

Michel Bargain, Lyon, and Maurice Ducloux, Irigny, both of France, assignors to Rhone-Poulenc S.A., Paris, France

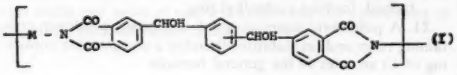
Filed Oct. 24, 1972, Ser. No. 299,731
Claims priority, application France, Oct. 26, 1971, 71.38425
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP 10 Claims

1. An adhesive imide copolymer consisting essentially of recurring units of the formula:



(II)

and at least 20% of recurring units of the formula;



(I)

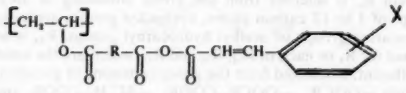
in which M represents an aliphatic or aromatic divalent radical and R represents a tetravalent aromatic radical.

3,933,746
PHOTOPOLYMERIZABLE POLYMERS HAVING ANHYDRIDE-CONTAINING GROUPS

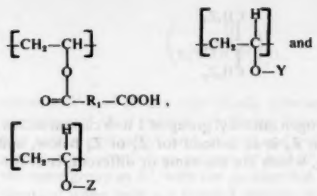
Fred W. Steele, Delaware, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed June 14, 1973, Ser. No. 370,258
Int. Cl.² C08F 116/06
U.S. Cl. 260—47 C 4 Claims

1. A polymer comprising as a recurring unit an anhydride-containing group represented by the structure:



wherein —CO—R—CO— is a residue of a dibasic acid selected from the group consisting of aliphatic dicarboxylic acids and aromatic dicarboxylic acids, and X is selected from the group consisting of hydrogen, halogen, lower alkoxy, lower alkyl and nitro, the remaining recurring unit being non-anhydride unit selected from the group consisting of:



wherein —CO—R_1—COOH is the residue of a dibasic acid selected from the group consisting of aliphatic dicarboxylic acids and aromatic dicarboxylic acids, Y is a member selected from the group consisting of hydrogen, lower acyl, lower alkyl and lower hydroxalkyl, and Z is a member selected from the group consisting of cinnamoyl, halocinnamoyl, lower alkoxy cinnamoyl, lower acyl cinnamoyl, lower hydroxalkyl cinnamoyl, and nitro cinnamoyl.

3,933,747
REVERSIBLE CROSS-LINKING OF MALEIC ANHYDRIDE COPOLYMERS

Robert M. Nowak, Midland; Kenneth J. Guilette, Menominee, and Eugene R. Moore, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 672,981, Oct. 5, 1967, abandoned. This application Apr. 2, 1971, Ser. No. 130,840
Int. Cl.² C08F 27/12, 15/02
U.S. Cl. 260—47 UP 4 Claims

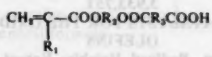
1. In a process for thermally reversing cross-links in a cross-linked composition by heating to about 175° to 300°C. and then cooling to reform a cross-linked composition wherein said composition comprises an intimate mixture of a vinyl interpolymer having reactive anhydride groups and a polyfunctional cross-linking agent, the improvement which comprises employing a cross-linking agent selected from the group consisting of hydrogenated 4,4′-isopropylidene diphenol, hydroxyalkyl diethers of 4,4′-isopropylidene diphenol and hydroxyalkyl diethers of hydrogenated 4,4′-isopropylidene diphenol wherein said hydroxyalkyl ether group in each case contains from 2 to 4 carbon atoms, employing a vinyl copolymer having from about 5 to 25 mole percent of an unsaturated dicarboxylic acid anhydride and employing a catalytic amount of a monoalkyl or a dialkyl phosphoric acid wherein the alkyl group contains from about 5 to 18 carbon atoms; said cross-linking agent present in an amount to provide about 0.05 to 0.5 moles of hydroxyl per mole of anhydride.

3,933,748
ANAEROBIC ADHESIVE CONTAINING TETRAHYDROQUINOLINE AND BENZOSULFIMIDE

Hideaki Matsuda, and Takanori Okamoto, both of Kagawa, Japan, assignors to Okura Kogya Kabushiki Kaisha, Japan

Filed Aug. 16, 1974, Ser. No. 498,207
Claims priority, application Japan, Aug. 21, 1973, 48-92904
Int. Cl.² C08F 218/14; C08G 81/00; C08F 120/02
U.S. Cl. 260—47 EP 4 Claims

1. An anaerobic adhesive composition comprising an anaerobic mixture consisting of (a) at least one polyvalent metal salt of a carboxylate compound of the formula



wherein R_1 is hydrogen or methyl, R_2 is an aliphatic, alicyclic or aromatic polyhydric alcohol residue, and R_3 is an aliphatic, alicyclic or aromatic polybasic carboxylic acid residue,

(b) a solvent compound having in its molecule an acrylic or methacrylic group, and (c) from 0.01 to 5%, by weight of the mixture, of benzosulfimide, from 0.1 to 10%, by weight of the mixture, of an organic peroxide and from .005 to 15%, by weight of the mixture, of a tetrahydroquinoline.

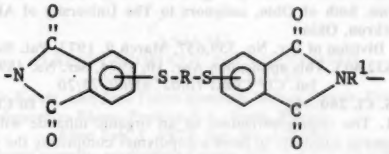
3,933,749

POLYTHIOETHERIMIDES AND METHOD OF PREPARATION

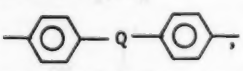
Frank J. Williams, III, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,135
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP **13 Claims**

1. Polythioetherimide consisting essentially of chemically combined units of the formula



where R is a divalent aromatic organic radical having from 6–30 carbon atoms and R^1 is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula,

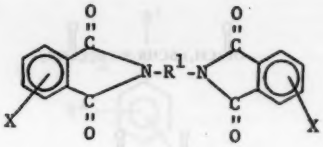


where Q is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,

—O—, and —S—, and y is a whole number from 1 to 5 inclusive.

13. A process which comprises

1. effecting reaction under anhydrous conditions at a temperature in the range of from 25° to 150°C between a bis nitrophthalimide of the formula



in the presence of a dipolar aprotic organic solvent with a dithiophenoxide salt of the formula,

M—S—R—S—M,

where R and R^1 are as previously defined as in claim **1**, M is an alkali metal and X is a displaceable radical selected from the class consisting of nitro, chloro, fluoro and bromo.

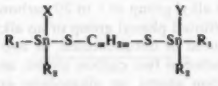
3,933,750

NOVEL STABILIZED POLYMER COMPOSITIONS

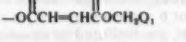
Harold Coates, Wombourne; John Desmond Collins, Albrighton, and Iftikhar Hussain Siddiqui, Birmingham, all of England, assignors to Albright & Wilson Limited, Oldbury near Birmingham, England

Division of Ser. No. 359,176, May 10, 1973, abandoned. This application July 22, 1974, Ser. No. 490,240
Int. Cl.² C08G 6/00
U.S. Cl. 260—45.75 S **6 Claims**

1. A stabilized polymer composition which comprises at least one resin containing at least 40% by weight of chlorine and selected from the group consisting of homopolymers of vinyl chloride and vinylidene chloride, postchlorinated polyolefins and copolymers of vinyl chloride or vinylidene chloride with up to 25%, based on the total weight of monomers, of other copolymerizable monomers, and as stabilizer therefor 0.01 – 10% by weight (based on the weight of the polymer) of an organothiotin compound of the formula

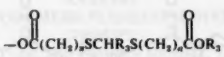


wherein each of R_1 and R_2, which are the same or different, is an alkyl group of 1–20 carbon atoms, a cycloalkyl or phenyl group; *m* is an integer of 1–8; each of X and Y, which are the same or different exhibits the formula



or

or



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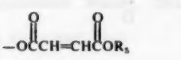
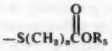
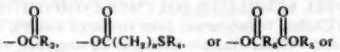


or and optionally not more than one of either X or Y may be SR_4

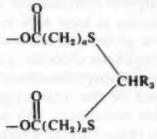


wherein Q_1 is of formula

and Q_2 is hydrogen, an alkyl group of 1 to 6 carbon atoms or CH_2Z_3, in which Z_3 is as defined for Z_1 or Z_2 below, and each of Z_1 and Z_2, which are the same or different, exhibits the formula



a pair of radicals selected from the group consisting of Z_1, Z_2 and Z_3 forms a group of formula



wherein R_3 is an alkyl group of 1 to 20 carbon atoms, a substituted or unsubstituted phenyl group or an alkyl phenyl group, which is substituted or unsubstituted, or two R_3 groups form a single bond between two carbon atoms, an alkylene group of 1 to 20 carbon atoms, an alkenylene group of 2 to 20 carbon atoms or a substituted or unsubstituted phenyl group; R_4 is an alkyl group of 1 to 20 carbon atoms or a substituted or unsubstituted phenylalkyl group with 1 to 6 carbon atoms in the alkyl group, or two R_4 groups are bonded together to form an alkylene group of 1 to 20 carbon atoms which is unsubstituted or substituted by at least one phenyl group, or an alkenylene group of 2 to 20 carbon atoms or a cycloalkylene group of 5 or 6 carbon atoms; R_5 is an alkyl group of 1 to 20 carbon atoms, a substituted or unsubstituted phenyl group or an alkylphenyl group which is substituted or unsubstituted, or two R_5 groups are bonded together to form an alkylene group of 1 to 20 carbon atoms; R_6 is a single bond, an alkylene group of 1 to 20 carbon atoms or an alkenylene group of 2 to 20 carbon atoms or a substituted or unsubstituted phenylene group and each of *a* and *n*, which are the same or different, is an integer of 1 to 6.

3,933,751

PROMOTED CATALYSTS FOR THE OXIDATION OF OLEFINS

James L. Callahan, Bedford Heights; Robert K. Grasselli, Cleveland, and Warren R. Knipple, Bedford, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 638,639, May 15, 1967, abandoned, which is a continuation-in-part of Ser. No. 604,118, Dec. 23, 1966, Pat. No. 3,431,292, which is a continuation-in-part of Ser. No. 311,657, Sept. 26, 1963, Pat. No. 3,328,315. This application May 7, 1971, Ser. No. 141,389

Int. Cl. C07c *45/04*

U.S. Cl. 260—604 R **10 Claims**

1. The process for the manufacture of unsaturated aldehydes which comprises the step of contacting in the vapor phase, at a temperature in the range of 500° to 1100°F, a mixture of oxygen and an olefin selected from the group consisting of propylene and isobutylene, said mixture having a molar ratio of oxygen to olefin of from about 0.5:1 to about 5:1 with a promoted catalyst composition consisting essentially of a base catalyst, a support and a promoter component, said base catalyst consisting essentially of the oxides of antimony and uranium, the Sb:U atomic ratio being within the range of about 1:50 to 99:1, said support being silica and said promoter component consisting essentially of an oxide of at least one element selected from the group consisting of iron, magnesium, bismuth, copper, zinc, arsenic, and cesium.

3,933,752

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

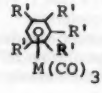
Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403. This application Apr. 10, 1974, Ser. No. 459,482

Int. Cl.² C08G *16/02, 61/00, 75/20*

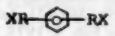
U.S. Cl. 260—61 **10 Claims**

1. The copolymerization of an organic dihalide with an aromatic substrate to form a copolymer comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding aromatic substrate monomers having the general formula

wherein R′ is selected from the group consisting of alkyl groups having from 1 to about 6 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, and hydroxide, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with organic dihalide monomers having the general formula



wherein R is selected from the group consisting of an alkylene group having from 1 to about 20 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, haloalkylene, aldehyde groups having from 1 to about 4 carbon atoms and sulfonyl, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to copolymerize said aromatic substrate monomers and said organic dihalide monomers by removing the dihalide from said organic dihalide monomers to form active organic monomers having carbonium ions which said active organic monomers initiate and continue the copolymerization to form the copolymer.

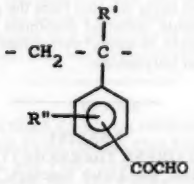
3,933,753
ALKENYLAROMATIC POLYMERS WITH α-KETOALHYDIC GROUPS

Emile Kuntz, and Jean Pierre Quentin, both of Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Feb. 1, 1973, Ser. No. 328,591
Claims priority, application France, Feb. 4, 1972, 72.03804
Int. Cl.² C08G 2/38, 10/06
U.S. Cl. 260—63 R **18 Claims**

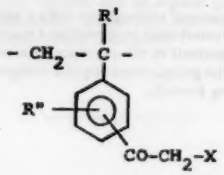
1. An alkenylaromatic polymer consisting essentially of:

a. 50–100% of recurring units of the formula:



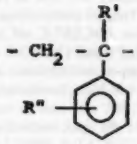
(VII)

or recurring units of formula (VII) and recurring units selected from units of the formula:



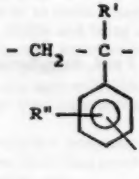
(IV)

and



(V)

and



(VI)

at least 0.01% of the recurring units being recurring units of formula (VII); and

b. 0–50% of recurring units of a non-aromatic ethylenically unsaturated monomer,

in which R′ represents a hydrogen atom or a methyl radical, R″ represents a hydrogen atom or a methyl or ethyl radical and X represents a halogen atom;

at least one of the aromatic rings in the recurring units of formulae (VII), (IV), (V), and (VI) optionally being substituted by halogen.

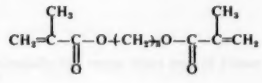
3,933,754
INSOLUBLE CHLOROPRENE POLYMER

Chojiro Kitagawa; Ichiro Fukuoka, both of Tokyo; Takashi Kadowaki, Niigata; Shoji Kimura, Machida; Takehiko Nishimura, Tokyo, and Kanehisa Hanabusa, Niigata, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

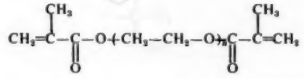
Division of Ser. No. 289,915, Sept. 18, 1972, Pat. No. 3,876,732, which is a division of Ser. No. 753,705, Aug. 19, 1968, Pat. No. 3,714,296. This application July 24, 1974, Ser. No. 491,427
Int. Cl.² C08F 15/26; C08G 2/26
U.S. Cl. 260—63 HA **20 Claims**

1. A toluene-insoluble gel polymer having a crosslinking density of at least 2.4×10^{-4} obtained by polymerizing chloro-

prene or a mixture of chloroprene with a small amount of at least one copolymerizable monomer to a monomer conversion of at least 80 percent in the presence of a crosslinking agent selected from the group consisting of a compound represented by the following formula:



wherein n is integer of from 1 to 8,



wherein n is integer of from 2 to 4, divinylbenzene and diallyl phthalate.

3,933,755

MELAMINE, FORMALDEHYDE, THIOUREA AND DIOL ETHER THERMOSETTING RESIN AND METHOD OF PREPARING THE SAME

Horst Michaud; Josef Seeholzer, both of Trostberg; Ludwig Pentzel, Tacherting, and Josefa Mangs, Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke AG, Trostberg, Germany

Continuation of Ser. No. 387,444, Aug. 10, 1973, abandoned, which is a continuation of Ser. No. 130,458, April 1, 1971, abandoned. This application May 22, 1974, Ser. No. 472,152

Claims priority, application Germany, June 2, 1970, 2027085

Int. Cl.² C08G *12/32*, *12/38*

U.S. Cl. 260—67.6 R **3 Claims**

1. A thermosetting resin composition capable of bonding paper to clipboard within two minutes at a temperature of 160°C and a pressure of 20 kg/cm² when mixed with 0.05% formamidinesulfinic acid, the resulting bond between said paper and said clipboard being stable at said temperature at atmospheric pressure, said resin composition essentially consisting of a liquid condensation mixture obtained by heating melamine, formaldehyde, thiourea, and a diol ether at 80° – 100°C and pH 8.6 – 8.8 until the condensation mixture first becomes turbid at 20°C when diluted with water to a solids content of 10% – 50%, said diol ether being of the formula $HO-(CH_2)_m-O-(CH_2)_m-OH$, wherein m is 2 or 3, the amount of said thiourea being 0.08 to 0.12 mole, the amount of said formaldehyde being 2 moles, and the amount of said diol ether being between 0.06 and 0.13 mole, said amounts being per mole of melamine.

3,933,756

PROCESS OF PREPARATION OF SYNTHETIC RESINS BY REACTING A CROSS-LINKED ISOCYANATE POLYADDITION PRODUCT WITH LOW MOLECULAR WEIGHT POLYISOCYANATE FOLLOWED BY REACTION WITH AN AMINO ALKYL SILANE

Kuno Wagner, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

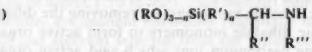
Continuation of Ser. No. 380,421, July 18, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,492

Claims priority, application Germany, Aug. 5, 1972, 2238741

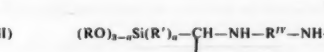
Int. Cl.² C08G *18/08*

U.S. Cl. 260—75 NE **9 Claims**

1. A process for the preparation of a synthetic resin capable of being cross-linked by moisture which comprises reacting, in a first step, a high molecular weight isocyanate polyaddition product cross-linked via allophanate, biuret or uretone imine groups in a polar solvent with a low molecular weight polyisocyanate at a temperature of 90° to 200°C and then reacting the resulting linearized product with an amino alkyl silane selected from a group consisting of

(I) 

or

(II) 

or

(III)
$$(RO)_{3-a}Si(R')_a-CH_2-(CH_2)_n-NH\text{-}R'''$$

wherein

R represents a C_1-C_{18} alkyl or C_4-C_{14} cycloalkyl radical or a phenyl radical,

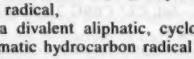
R' represents an optionally halogenated or cyanosubstituted C_1-C_{10} alkyl, C_4-C_{10} cycloalkyl or C_6-C_{10} aryl radical,

R'' represents a hydrogen atom or a methyl or phenyl radical,

R''' represents a hydrogen atom or an optionally halogenated or cyanosubstituted C_1-C_{18} alkyl, C_4-C_{14} cycloalkyl or C_6-C_{14} aryl radical,

R^{IV} represents a divalent aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon radical containing 2 to 16 carbon atoms,

R^V represents hydrogen or



$a=0$, 1 or 2 and $n=1$–7,

said polar solvent being selected from the group consisting of dimethyl formamide, dimethyl acetamide, tetramethyl urea, dimethyl sulphoxide, N-methyl pyrrolidone, glycol carbonate, caprolactone and butylactone.

3,933,757

DICYCLOPENTADIENE THERMOSETTING POLYESTER

Ivor Pratt, Medina, and Ulrich Boschert, Tallmadge, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 330,474, Feb. 8, 1973, Pat. No. 3,883,612. This application Oct. 21, 1974, Ser. No. 516,447

Int. Cl.² C08G *63/46*

U.S. Cl. 260—75 A **4 Claims**

1. A method of synthesizing a thermosetting dicyclopentadiene terminated polyester from glycol, dicarboxylic acid, and dicyclopentadiene, said polyester suitable for mixing with

sytrene to provide a thermosettable polyester resin, the improvement comprising:

reacting an excess molar equivalent of dicarboxylic acid with glycol to produce an acid terminated partial polymer having carboxyl groups;

reacting about 0.1–0.4 mols of dicyclopentadiene per mol of unsaturated dicarboxylic acid with said acid terminated partial polymer at temperatures between about 290°–310°F. until substantially all of said dicyclopentadiene is esterified with said carboxyl groups.

3,933,758

IMINOIMIDAZOLIDINEDIONE AND PARABANIC ACID POLYMERS CONTAINING IMIDE GROUPS

Tad L. Patton, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 26, 1973, Ser. No. 409,964

Int. Cl.² C08G *18/00*

U.S. Cl. 260—77.5 CH **14 Claims**

1. As a composition of matter a new class of polymers which are iminoimidazolidinedione polymers containing imide groups or their hydrolysis derivatives, which are parabanic acid polymers containing imide groups.

3,933,759

HEAT-ACTIVATABLE, STORAGE-STABLE POLYURETHANE POWDERS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

No Drawing. Filed Dec. 20, 1974, Ser. No. 535,135

Int. Cl.² C08G *18/80*

U.S. Cl. 260—77.5 TB **30 Claims**

1. In a process of forming a heat-activatable polyurethane powder characterized by low-melt viscosity upon initial melting, and in which powder the particles are essentially bead-like in form, the improvement wherein

1. the melt viscosity is achieved by preparing a reaction product of
   a. one mole of a polymeric glycol having a molecular weight of 400–4,000,
   b. X moles of a diol having a molecular weight of less than 250 wherein X equals 0–20,
   c. Y moles of an organic diisocyanate wherein Y equals 1.03 (1 + X) to 1.60 (1 + X),
   d. 0.03 (1 + X) to 0.60 (1 + X) moles of a monofunctional isocyanate blocking agent, and
   e. Y - X - 1 moles of a difunctional active hydrogen compound, wherein
2. the heat-activatable property is achieved by selecting the amounts of reactants (d) and (e) so that the polyurethane powder contains about stoichiometric amounts of blocked —NCO groups and active hydrogen-containing groups, and wherein
3. the size and shape of bead particle is achieved by initially emulsifying reactants (a) and (b) in an inert organic solvent with the aid of a surfactant, followed by converting said emulsion to a dispersion of finely divided polyurethane beads and recovering the latter.

3,933,760

LOW TEMPERATURE CURING CORROSION RESISTANT POLYURETHANE COATINGS

Kazys Sekmakas, and Paul Petrovich, both of Chicago, Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 19, 1974, Ser. No. 462,564

Int. Cl.² C08G *18/62*

U.S. Cl. 260—77.5 CR **9 Claims**

1. A low temperature curing polyurethane coating system comprising a liquid mixture of a solution copolymer of from 55–85% of styrene with the balance of the copolymer consisting essentially of monoethylenically unsaturated hydroxy functional monomer, said copolymer being in solution in inert water-free organic solvent, and an organic polyisocyanate in at least a stoichiometric proportion with respect to the hydroxy functionality in said copolymer.

3,933,761

NITROGEN-CONTAINING ESTER AND LUBRICANT CONTAINING THE SAME

Lester Earl Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 125,380, March 17, 1971, abandoned, and a continuation-in-part of Ser. No. 125,401, March 17, 1971, Pat. No. 3,702,300, said Ser. No. 125,380, is a division of Ser. No. 867,915, Oct. 20, 1969, abandoned, said Ser. No. 125,401, is a continuation-in-part of Ser. No. 867,915, Oct. 20, 1969, abandoned, said Ser. No. 867,915, is a continuation-in-part of Ser. No. 785,735, Dec. 20, 1968, abandoned. This application Aug. 10, 1972, Ser. No. 279,421

Int. Cl.² C08F *8/14, 8/32, 222/22*

U.S. Cl. 260—78.5 T **15 Claims**

1. An oil-soluble nitrogen-containing mixed ester of a carboxy-containing interpolymer having low-temperature viscosity improving properties and a reduced specific viscosity of from about 0.05 to about 2, said ester being substantially free of titratable acidity and being characterized by the presence within its polymeric structure of at least one of each of three pendant polar groups:

A. a relatively high molecular weight carboxylic ester group having at least eight aliphatic carbon atoms in the ester radical,

B. a relatively low molecular weight carboxylic ester group having no more than seven aliphatic carbon atoms in the ester radical, and

C. a carbonyl-polyamino group derived from a polyamino compound having one primary or secondary amino group,

wherein the molar ratio of (A):(B):(C) is (60–90):(10–30):(2–15).

3,933,762

HOT MELT ADHESIVES FROM LACTAM COPOLYAMIDES

Nagayoshi Naito; Sadakatu Hashimoto; Yoshiyuki Komuro; Tutomu Suyama, and Yukio Yonekura, all of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,627

Claims priority, application Japan, June 27, 1973, 48-71650; July 17, 1973, 48-79854

Int. Cl.² C08G *77/02, 69/14;* **C09J** *3/16*

U.S. Cl. 260—78 L **5 Claims**

1. Hot-melt adhesives for fibers consisting essentially of a copolyamide prepared by copolymerizing the following four monomers:

A. more than 5 and less than 20% by weight on the basis of the total amount of monomers of laurolactam and

B. resulting portion of comonomers consisting essentially of
   a. 30 to 75% by weight of ε-caprolactam
   b. 5 to 40% by weight of hexamethylenediammonium adipate
   c. 20 to 65% by weight of hexamethylenediammonium sebacate,

wherein the total of (a), (b), and (c) is 100% by weight.

3,933,763
POLYMERIZATION OF MALEIC ANHYDRIDE AND VINYL ACETATE

Louis A. Goretta, Naperville, and John D. Newkirk, Downers Grove, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

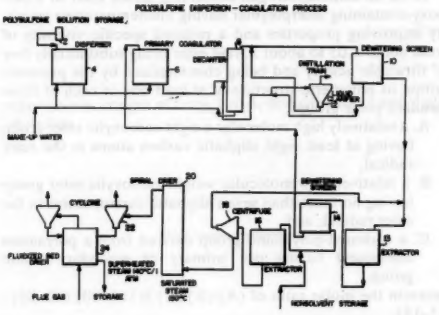
Filed July 18, 1974, Ser. No. 489,806
Int. Cl.² C08F 2/06
U.S. Cl. 260—78.5 R **5 Claims**

1. A method of polymerizing maleic anhydride and vinyl acetate in a solvent selected from the group consisting of toluene and benzene comprising carrying the polymerization out in the presence of a stabilizing agent comprising a copolymer of maleic anhydride and an alpha-olefin containing from four to 18 carbon atoms, the amount of stabilizing agent being from 0.5 to 6% by weight of maleic anhydride.

3,933,764
COAGULATIVE RECOVERY OF POLYSULFONE RESINS FROM SOLUTIONS THEREOF

Lee P. McMaster, Long Valley, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,845
Int. Cl.² C08G 75/20
U.S. Cl. 260—79.3 M **15 Claims**



1. Method for the coagulative recovery of normally solid polyarylene polyether polysulfone thermoplastic resin from a solution thereof which comprises:

A. Dispersing a solution of about 5–40% by weight solids content of normally solid polyarylene polyether polysulfone thermoplastic resin dissolved in an organic solvent having a solubility parameter, δ, of about 7 to about 11 with a fractional polarity of about 0.04 to 0.4 in a continuous carrier liquid phase as discrete droplets having a Sauter mean diameter of about 50 to about 250 microns.

B. Contacting the dispersion of (A) with an aliphatic hydrocarbon having five to about 10 carbon atoms and a solubility parameter, δ, of about 7 to about 8 in a turbulent shear field so that each discrete droplet of resin solution coalesces with and is surrounded by said aliphatic hydrocarbon;

C. Continuing agitation of the contacted dispersion until sufficient organic solvent has diffused out of the resin droplets and sufficient aliphatic hydrocarbon has diffused into the resin droplets whereby normally solid, porous, non-agglomerated polyarylene polyether polysulfone thermoplastic particles are obtained;

D. Isolating from the continuous carrier liquid phase normally solid resin particles containing a mixture of organic solvent and aliphatic hydrocarbon;

E. Removing organic solvent and aliphatic hydrocarbon not trapped within the pores of the normally solid resin particles from said resin particles;

F. Extracting residual organic solvent from the normally solid resin particles with an aliphatic hydrocarbon having five to 10 carbon atoms and a solubility parameter, δ, of about 7 to about 8; and

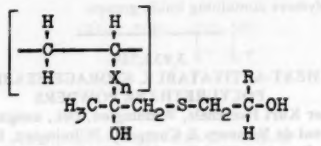
G. Reducing the level of liquids in the extracted normally solid resin particles to less than 500 ppm.

3,933,765
POLYMERS CONTAINING THIOGLYCOL GROUPS

Herbert Naarmann, Wattenheim, and Heinz Pohlemann, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

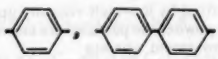
Filed Mar. 21, 1974, Ser. No. 453,376
Claims priority, application Germany, Mar. 31, 1973, 2316299
Int. Cl. C08f 3/84
U.S. Cl. 260—79.7 **1 Claim**

1. Polymers containing units of the general formula:



in which

X denotes $-CH_2-$, $-CH_2-CH_2-$,



or divalent C_{3-10} cycloalkyl,

n is 0 or 1 and

R denotes H, C_{1-10} alkyl or aryl.

3,933,766
MANUFACTURE OF INSOLUBLE AND ONLY SPARINGLY SWELLABLE POLY-N-VINYLPYRROLIDONE-2 OR COPOLYMERS OF N-VINYLPYRROLIDONE WITH OTHER N-VINYLLACTAMS

Ernst Hofmann, and Karl Herrle, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhein), Germany

Filed Nov. 9, 1973, Ser. No. 414,330
Claims priority, application Germany, Nov. 11, 1972, 2255263
Int. Cl.² C08F 2/04, 226/10
U.S. Cl. 260—80.3 R **3 Claims**

1. A process for the manufacture of insoluble cross-linked and only sparingly swellable copolymers of N-vinylpyrrolidone-2 consisting essentially of: heating to at least 80°C monomeric N-vinylpyrrolidone-2 in an aqueous solution containing from 0.5 to 10% by weight, based on monomeric N-vinylpyrrolidone-2, of a cyclic acid amide containing at least 2 ethylenically unsaturated groups of which at least one is attached to an amide nitrogen atom to initiate the polymerization reaction of said N-vinyl-pyrrolidone-2 and said cyclic acid amide and thereafter completing the reaction at the boiling temperature of water.

3,933,767

CYANOPERFLUOROETHER ACID FLUORIDES AND COPOLYMERS DERIVED THEREFROM

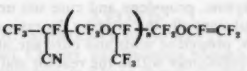
James E. Nottke, Greenville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 262,590, June 14, 1972, Pat. No. 3,852,326. This application May 22, 1974, Ser. No. 472,420

Int. Cl.² C08F *214/18, 214/20, 214/22, 214/26*

U.S. Cl. 260—80.76 3 Claims

1. A copolymer of at least one cyanoperfluoro(vinyl ether) of the formula



where *n* is an integer from 0 to 4 and at least one member of the group

vinylidene fluoride, tetrafluoroethylene, chlorotrifluoroethylene, hexafluoropropylene,

1,1,1,2,3-pentafluoropropylene and

$CF_2{=}CF{-}O{-}R_f$, where R_f is perfluoroalkyl of one to three carbons.

3,933,768

METHOD OF PRODUCING DIHALOCYCLOPROPANE FUNCTIONAL MULTICOMPONENT COPOLYMERS

Toshio Yukuta; Takao Aoki; Kazuo Haga; Takashi Ohashi, all of Kodaira, and Masumi Saito, Tanashi, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 28, 1972, Ser. No. 283,956

Claims priority, application Japan, Sept. 2, 1971, 46-67016

Int. Cl.² C08F *236/22, 8/24*; C08C *19/18*

U.S. Cl. 260—80.78 2 Claims

1. A dihalocyclopropane functional multi-component copolymer containing dihalocyclopropane functional groups in the side chain or in the cyclic group in the main chain, which is obtained by subjecting a multi-component copolymer prepared from at least two alpha olefins having 2–8 carbon atoms and at least one non-conjugated diolefin compound to the reaction with dihalocarbene generated from halogenated hydrocarbon in the presence of a cation surfactant catalyst selected from the group consisting of tetraalkylammonium chloride, tetraalkylammonium bromide, trialkylbenzylammonium chloride, trialkylbenzylammonium bromide, alkylpyridinium chloride and alkylpyridinium bromide by using an alkali-aqueous solution to introduce dihalocyclopropane functional groups into said said chain or said cyclic group.

3,933,769

SULFUR VULCANIZABLE INTERPOLYMERS

Joginder Lal, Akron, and Paul H. Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 9, 1974, Ser. No. 530,917

Int. Cl.² C08F *4/52, 36/20, 136/20, 236/20*

U.S. Cl. 260—80.78 8 Claims

1. Sulfur vulcanizable unsaturated interpolymers prepared from at least one terminally unsaturated monoolefin selected from the group consisting of 1-butene and α-olefins containing from five to 12 carbon atoms with a nonconjugated diolefin wherein said nonconjugated diolefin is a mixture of 4- and 5-methyl-1,4-hexadienes in which said 5-methyl-1,4-hexadiene is at least 15 mole percent of said nonconjugated diolefin mixture and in which said terminally unsaturated monoolefin comprises from about 98 to about 70 mole percent of the total monomer charged.

3,933,770

METHOD OF PREPARING TRANSITION METAL COMPLEX CATALYSTS

Sakuji Ikeda; Atsumu Ozaki; Makoto Okawara, all of Tokyo; Tsutomu Mizoroki, Yokohama; Masahiro Uchino, Tokyo; Hideki Shirakawa, Yokohama, and Noboru Kawata, Kawasaki, all of Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 452,839

Claims priority, application Japan, Sept. 13, 1973, 48-103678

Int. Cl.² C08F *8/30, 8/40, 8/42*

U.S. Cl. 260—87.5 R 2 Claims

1. A method for preparing transition metal complex catalysts combined with organic high polymers, comprising mixing a halogenated high polymer selected from the group consisting of chlorinated, brominated and iodinated polystyrene and chlorinated, brominated and iodinated styrene-divinylbenzene copolymer with a complex of transition metal selected from the group consisting of nickel, palladium and platinum in an organic solvent, said transition metal being in a low oxidation state.

3,933,771

COMPOSITION OF AND METHOD OF OBTAINING SMALL PARTICLE SIZE POLYMERS AND COPOLYMERS OF VINYL CHLORIDE HAVING A FUSED SURFACE

David W. Eastman, Angola; Anthony L. Lemper, Tonawanda; Victor A. Pattison, Clarence Center; George C. Hopkins, Clarence; Henry Kahn, Williamsville, all of N.Y., and Jack L. Nickels, Willingboro, N.J., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 379,886, July 16, 1973, abandoned, which is a continuation of Ser. No. 172,546, Aug. 17, 1971, abandoned. This application June 24, 1974, Ser. No. 482,111

Int. Cl.² C08F *3/30, 15/06*

U.S. Cl. 260—87.1 8 Claims

1. A process for preparing vinyl chloride polymer or copolymer particles having a fused, glassy surface which comprises:

1. polymerizing a monomer or monomers in a first stage at a temperature of about 30° to about 80°C and in contact with at least one of an additive selected from the group consisting of
   - A. an inorganic or organic, inert, fine particle size material, solid at least at reaction temperature and insoluble in said monomer or monomers, said material having an average particle size in the range of about 0.001 to about 50 microns and said material being present in the amount of 0.001 to 5 percent based upon said monomer or monomers present in said first stage, and
   - B. a surface active agent in an amount of 0.01 to 5 percent by weight based upon the monomer or monomers present in said first stage

during which the reaction mixture is subjected to high speed agitation until about 3 percent to about 15 percent by weight of said monomer or monomers have been converted to polymer particles, and

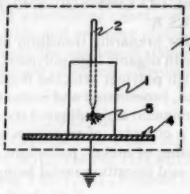
2. continuing the preparation of polymer particles by polymerization in a second stage during which said reaction mixture is subjected to low speed agitation at a temperature of about 30° to about 80° centigrade and completing the reaction by increasing the temperature of the reaction mixture to about 60° to about 95° centigrade, the increase in temperature being in the range of about 10° to about 65° centigrade, so that at least 10 to about 50 percent of monomer or monomers present in said second stage are polymerized to provide on the surface of the polymer particles a low molecular weight, glassy, fused coating of polymer.

3,933,772

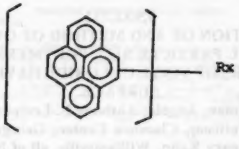
DIELECTRIC POLYOLEFIN COMPOSITIONS

Masaaki Takahashi; Akira Ito, both of Tokyo; Yuriko Igarashi, Mitaka; Shichiro Kawada, Hitachi; Jiro Ogura, Hitachi, and Ryoichi Ito, Hitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,256
Claims priority, application Japan, July 3, 1973, 48-74364
Int. Cl.² C08F *210/00, 212/00, 218/00;* H01B *3/00*
U.S. Cl. 260—87.3 7 Claims



1. A dielectric composition comprising a polyolefin and an alkylpyrene of the formula



wherein R represents an alkyl group containing from 1 to 4 carbon atoms and x is an integer of 1 to 4, provided that when x is an integer of 2 or greater, R may be the same or different; said alkylpyrene being present in an amount of at least 0.5 parts by weight per 100 parts by weight of said polyolefin.

3,933,773

THERMOPLASTIC ELASTOMERIC COPOLYMERS AND TERPOLYMERS OF TETRAFLUOROETHYLENE AND PROPYLENE AND METHOD OF MAKING THE SAME

Rolf F. Foerster, Lawrenceville, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 260,795, June 8, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,132
Int. Cl.² C08F *2/32, 214/26*
U.S. Cl. 260—87.5 B 8 Claims

1. In a process for copolymerizing tetrafluoroethylene and propylene in an emulsion polymerization reaction mixture in a reactor at a temperature of 5° to 120°C. and at a pressure of 100 to 1,000 p.s.i.g., the improvement which consists in initially charging said reactor with an emulsion polymerization reaction mixture consisting essentially of tetrafluoroethylene and propylene in a molar ratio of 1.0:0.01 to 1.0:0.087, adding an initiator to said mixture to cause said tetrafluoroethylene and propylene to form an initial copolymer having a molar ratio of tetrafluoroethylene units to propylene units of at least 1.0:0.54 and thereafter continually feeding to said reactor a monomer mixture having a molar ratio of tetrafluoroethylene to propylene that is substantially the same as the ratio of tetrafluoroethylene units to propylene units in the initially formed copolymer within the reactor and at a feed rate to maintain the reactor pressure substantially constant to cause the monomers within the reactor to be replenished at approximately the same rate as they are consumed in the polymerization reactor and thereby produce a copolymer having a molar ratio of tetrafluoroethylene units to propylene units of from 1.0:0.11 to 1.0:0.54.

2. In a process for preparing a terpolymer of tetrafluoroethylene, propylene and a cure site monomer in an emulsion polymerization reaction mixture in a reactor at a temperature of 5° to 120°C. and a pressure of 100 to 1,000 p.s.i.g., the improvement which consists in initially charging said reactor with an emulsion polymerization reaction mixture consisting essentially of tetrafluoroethylene and propylene in a molar ratio of 1.0:0.01 to 1.0:0.087 and up to 10 mole percent of a cure site monomer, adding an initiator to said mixture to cause said tetrafluoroethylene, propylene and cure site monomer to form an initial terpolymer having a molar ratio of tetrafluoroethylene units to propylene units of at least 1.0:0.54, thereafter continually feeding to said reactor a monomer mixture of tetrafluoroethylene, propylene and cure site units in a molar ratio that is substantially the same as the ratio of tetrafluoroethylene units, propylene units and cure site units in the initially formed copolymer within the reactor and at a feed rate to maintain the reactor pressure substantially constant to cause the monomers within the reactor to be replenished at approximately the same rate as they are consumed in the polymerization reaction and thereby produce a copolymer having a molar ratio of tetrafluoroethylene units to propylene units of from 1.0:0.11 to 1.0:0.54.

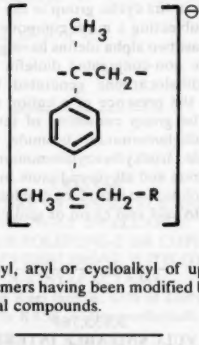
3,933,774

MODIFIED POLYMERS OF DIISOPROPENYLBENZENE

Franz Neumayr, Weisenheim; Gerhard Fahrbach, Schwetzingen, and Erhard Seiler, Freiburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 21, 1974, Ser. No. 453,375
Claims priority, application Germany, Apr. 7, 1973, 2317602
Int. Cl.² C08F *210/00, 212/00, 236/04, 136/02*
U.S. Cl. 260—88.2 8 Claims

1. Modified copolymers of from 99 to 50% by weight of a vinyl aromatic compound or diene hydrocarbon and from 1 to 50% by weight of diisopropenylbenzene and having a content of at least 0.2% by weight of a group of the general formula:



in which R is alkyl, aryl or cycloalkyl of up to 36 carbon atoms, said copolymers having been modified by reaction with organo-alkali metal compounds.

3,933,775

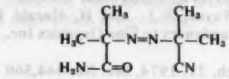
2[(1-CYANO-1-METHYLETHYL)AZO]-2-METHYLPROPIONAMIDE

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 357,524, May 7, 1973. This application Mar. 5, 1974, Ser. No. 448,364
Int. Cl.² C08F *118/08, 120/44, 114/06, 120/12*
U.S. Cl. 260—89.1 8 Claims

1. A method for the emulsion polymerization of ethylenically unsaturated compounds selected from butadiene, isoprene, esters of acrylic acid and methacrylic acid, acrylonitrile, methacrylontirile, vinyl acetate, vinyl chloride, vinylidene chloride, styrene and alpha methyl styrene which comprises initiating the polymerization of the ethylenically unsaturated compound across the ethylenically unsaturated double

bond in an aqueous solution with at least 0.01% by weight of



based on the weight of the ethylenically unsaturated compound.

3,933,776

BULK POLYMERIZATION OF VINYL CHLORIDE

Francis Fournel, Chauny, and Salomon Soussan, St-Fons, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed Apr. 2, 1974, Ser. No. 457,193

Claims priority, application France, Apr. 3, 1973, 73.11938

Int. Cl.² C08F *3/30, 15/30*

U.S. Cl. 260—92.8 R **8 Claims**

1. A process for preparing polymers and copolymers of vinyl chloride by bulk polymerization, which comprises feeding to a reaction zone of a vessel maintained at the polymerization temperature (t_1) a solution (A) comprising monomeric material to be polymerized and at least one polymerization initiator, solution (A) being prepared by preheating at least 50% of the monomeric material in the absence of catalyst to a temperature (t_2) within 20°C of the temperature (t_1) and immediately prior to being fed to the reaction zone, mixing the preheated constituent (B) and a solution (C) of the initiator or initiators in an organic solvent including the remainder, if any, of the monomeric material.

3,933,777

METHOD FOR PREPARING POLYALKENAMERS

Boris Davidovich Babitsky, ulitsa Krasnogo Kursanta, 7, kv. 9; Tamara Trofimovna Denisova, ulitsa Zaitseva, 6, kv. 71; Vitaly Abramovich Kormer, ulitsa Zheleznovodskaya, 62, kv. 2; Irina Moiseevna Lapuk, Narvsky prospekt, 8, kv. 18; Mark Iosifovich Lobach, prospekt Annikova, 28, kv. 52; Nadezhda Pavlovna Simanova, ulitsa Kolomenskaya, 22, kv. 57, all of Leningrad; Kim Sergeevich Soloviev, Golovinskoe shosse, 4, kv. 17, Moscow; Tamara Yakovlevna Chepurnaya, Bulvar Novatorov, 88, kv. 39, and Tatyana Lvovna Jufa, ulitsa Tipanova, 29, kv. 513, both of Leningrad, all of U.S.S.R.

Filed Mar. 11, 1974, Ser. No. 450,226

Claims priority, application U.S.S.R., Mar. 9, 1973, 1891808; Mar. 9, 1973, 1891809; Mar. 9, 1973, 1891810; Mar. 9, 1973, 1891812

Int. Cl.² C08F *4/06, 4/42*

U.S. Cl. 260—93.1 **2 Claims**

1. A method for the preparation of a polyalkenamer by homopolymerization comprising subjecting an alicyclic unsaturated compound having from 4 to 5 and 7 to 12 carbon atoms and from 1 to 4 double bonds in the ring to polymerization with ring opening in the presence of a catalyst consisting of three components: a) a compound selected from the group of a transition metal compound comprising π-complexes of transition metals having the general formula

$$A_nM_1X_pL_k$$

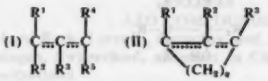
wherein:

M_1 is a transition metal selected from groups IV–VIII of the Periodic System;

X is a ligand selected from the group consisting of halogen, acetate, alkoxyl, cyanide, cyclopentadienyl, acetylacetonate, alkyl- and arylsulfonate group;

L represents a ligand selected from the group consisting of carbonyl, cyclopentadienyl, cyclooctadiene, benzene, cycloheptatriene, cyclododecatriene, trihalogenphosphine, triphenylphosphine, triphenylphosphite;

A stands for a ligand selected from π-allylic ligands having the general formula



wherein:

R^1,R^2,R^3,R^4,R^5 are ligands selected from the group consisting of hydrogen, halogen, alkyl, cyanoalkyl and aryl having from 1 to 10 carbon atoms;

n=0-4; p=0-3; k=0-6; m=1-2; q=1-9;

and transition metal compounds of the general formula

$$M_2R_aX_b\ Y_c$$

wherein:

M_2 is molybdenum or tungsten;

R is a ligand selected from a group consisting of halogen, aliphatic and aromatic substituent having from 1 to 10 carbon atoms;

X represents a ligand selected from a group consisting of halogen, acyl, alkoxy-, aryloxy- and acetylacetonate groups;

Y stands for a ligand selected from the group comprising ether and amine;

a=0-6; b=0-6; c=0-3;

$a + b = a$ valence of M_2 metal;

b. a compound of a metal selected from Groups I–VI of the Periodic System having the general formula $M_3U_dZ_e$, P_f

wherein:

M_3 is a metal selected from Groups I–VI of the Periodic System;

U is a ligand selected from the group consisting of hydrogen, halogen and alkoxy-group;

Z represents a ligand selected from the group consisting of halogen, aliphatic and aromatic ligands having from 1 to 18 carbon atoms;

P stands for a ligand selected from the group comprising ether and amine;

d = 0-4; e = 0-4; g = 1-2; f = 0-2; and

c. an activator selected from the group consisting of quinones, halogenated quinones and an acid halide of sulfur-containing acid having the general formula

$$R_kSO_tQ_l$$

wherein:

R is a ligand selected from the group consisting of halogen, alkyl, aryl, nitro- and amino-group;

Q is a ligand selected from the group of halogens;

S represents sulfur;

O stands for oxygen;

k=0-1; n=1-2; t=1-2; wherein the molar ratio of the catalyst components $a:b:c$ is 1:0.1-50:0.1-10 and the molar ratio of the monomer to the transition metal compound is within the limits 100-20,000:1.

3,933,778

PROCESS FOR THE POLYMERISATION OF CYCLOOCTADIENE

Gottfried Pampus; Günther Lehnert, both of Leverkusen, and Josef Witte, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 20, 1974, Ser. No. 481,208

Claims priority, application Germany, June 27, 1973, 2332565

Int. Cl.² C08F *4/22*

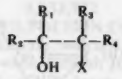
U.S. Cl. 260—93.1 **5 Claims**

1. A process for producing polyoctadienamers having 20 to 85 percent of the double bonds in the transconfiguration which comprises polymerizing cyclooctadiene-(1,5) in the presence of a catalyst comprising:

a. a tungsten salt;

b. at least one member selected from the group consisting of

i. a halo alcohol of the formula



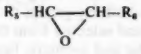
wherein

X is chlorine, bromine or iodine;

R_1 and R_2, when taken separately, are the same or different and are each selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 10 carbon atoms and alkaryl having 1 to 6 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety;

R_3 and R_4 may be the same or different and are each selected from the group consisting of chlorine, bromine, iodine, hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 10 carbon atoms and alkaryl having 1 to 6 carbon atoms in the alkyl moiety and having 6 to 10 carbon atoms in the aryl moiety, and R_1 and R_2, when taken together with the carbon atoms to which they are attached, form a hydrocarbon ring containing at least 5 carbon atoms;

ii. an epoxide of the formula

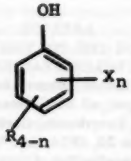


wherein

R_5 is hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 10 carbon atoms or alkaryl having 1 to 6 carbon atoms in the alkyl moiety and having 6 to 10 carbon atoms in the aryl moiety; and

R_6 is hydrogen, alkyl, chloroaklyl, bromoalkyl or iodoalkyl, each having 1 to 6 carbon atoms in the alkyl moiety, aryl having 6 to 10 carbon atoms or aralkyl having 6 to 10 carbon atoms in the aryl moiety and having 1 to 6 carbon atoms in the alkyl moiety; and

iii. a halo phenol of the formula



wherein X is aforesaid, R is alkyl having 1 to 6 carbon atoms, aryl having 6 to 10 carbon atoms or a condensed aromatic group, and *n* is an integer of from 1 to 4;

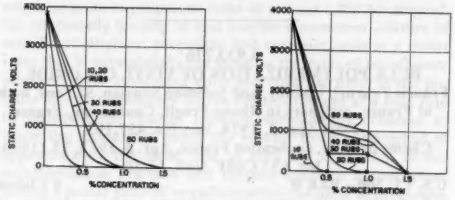
c. an aluminum organic compound, an aluminum halide or a mixture thereof,

said catalyst containing 0.05 to 10 mmol of tungsten per 100 gm of cyclooctadiene-(1,5), 1 to 6 mols of (b) per mol of tungsten and 0.05 to 30 mol of (c) per mol of tungsten.

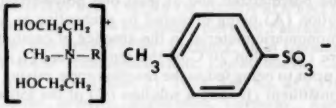
3,933,779
ANTISTATIC POLYMER BLEND

Seymour Baron, Wayne, N.J., and H. Harald Lutzmann, Cleveland, Ohio, assignors to Fine Organics Inc., Cleveland, Ohio

Filed Feb. 21, 1974, Ser. No. 444,560
Int. Cl.² C08K *5/19*; C08F *12/08*, *112/08*
U.S. Cl. 260—93.5 A **11 Claims**



1. A synthetic polymer having incorporated therewith an antistatically effective amount of a compound of the formula:



wherein R is alkyl of 4 to 18 carbon atoms unsubstituted or substituted by halogen or aryl.

3,933,780
HIGH SOLIDS SOAPS OF FATTY ACIDS AND FATTY OIL DERIVED POLYCARBOXYLIC ACIDS

Benjamin F. Ward, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed May 21, 1973, Ser. No. 361,939
Int. Cl.² C09F *1/04*
U.S. Cl. 260—97.5 **1 Claim**

1. A soap composition consisting essentially of,

a. from 10 to 90 percent by weight of a polycarboxylic acid soap consisting of a fatty acid or oil from the group consisting essentially of soya fatty acid, tall oil fatty acid, cotton seed fatty acid, tallow fatty acid, corn oil, tung oil and linseed oil modified by reacting with a maleyl compound from the group consisting essentially of maleic anhydride and maleic acid at a temperature between 180°C. and 300°C. for between 30 minutes and 6 hours and neutralized with a member of the group consisting essentially of potassium, sodium and ammonium, and

b. 10 to 90 percent by weight of a soap from the group consisting essentially of tall oil fatty acid, oleic acid, tallow, coconut fatty acids and soya fatty acid.

3,933,781
PROCESS FOR THE PREPARATION OF α-L-ASPARTYL-L-PHENYLALANINE ALKYL ESTERS

Gerald L. Bachman; Marvin L. Oftedahl, and Billy D. Vineyard, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 5, 1973, Ser. No. 412,928
Int. Cl.² C07C *103/52*; A23L *1/22*
U.S. Cl. 260—112.5 **14 Claims**

1. A process comprising reacting an N-protected-L-aspartic anhydride with L-phenylalanine to form N-protected-α-L-aspartyl-L-phenylalanine wherein the N-protecting group is selected from the group consisting of formyl, acetyl, benzoyl, substituted and unsubstituted carbobenzoxy, t-butoxycarbonyl and the hydrohalide salts, removing the protecting group from the N-protected-α-L-aspartyl-L-phenylalanine to form α-L-aspartyl-L-phenylalanine and esterifying the α-L-aspartyl-

L-phenylalanine with an alkanol having from 1 to 3 carbon atoms to form the corresponding α-L-aspartyl-L-phenylalanine alkyl ester which is recovered.

3,933,782

(N-ACETYL)-PRO-D-PHE-TRP-SER-TYR-D-ALA-LEU-ARG-PRO-NHET AND INTERMEDIATES

John P. Yardley, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,953
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 LH 6 Claims

1. A compound selected from the group consisting of (N-Acetyl)-L-Pro-D-Phe-L-Trp-L-Ser-L-Tyr-D-Ala-L-leu-L-Arg-L-Pro-NHEt and its non-toxic salts.

3,933,783

FORMATION OF PEPTIDE BONDS IN THE PRESENCE OF ISONITRILES

Naohiko Yasuda, Kawasaki; Yasuo Ariyoshi, and Koji Toi, both of Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 317,921, Dec. 26, 1972, Pat. No. 3,872,099. This application Dec. 9, 1974, Ser. No. 530,494
Claims priority, application Japan, Dec. 27, 1971, 46-1997; Nov. 27, 1972, 47-115332
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 11 Claims

1. A method of producing a peptide which comprises contacting a first compound having an amino group masked by a masking group conventional in peptide chemistry and an available carboxyl group with a second compound having a carboxyl group masked by a masking group conventional in peptide chemistry and an available amino group in a liquid reaction medium including an amount of an isonitrile effective for causing formation of a peptide by condensation of the available amino and carboxyl groups of said first and second compounds, said compounds being members of the group consisting of amino acids and oligopeptides, and being contacted until said peptide is formed as a reaction product.

3,933,784

DES-(SER[13])-SRIF AND INTERMEDIATES

Dimitrios Sarantakis, Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,252
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 6 Claims

1. A tridecapeptide selected from those of the formula

H—Ala—Gly—Cys—Lys—Asn—Phe—

Phe—Trp—Lys—Thr—Phe—Thr—Cys—OH,

H—Ala—Gly—Cys—Lys—Asn—Phe—

—Phe—Trp—Lys—Thr—Phe—Thr—Cys—OH

and the non-toxic acid addition salts thereof, said amino acid residues in said tridecapeptide having an asymmetric α-carbon atom being of the L-configuration.

3,933,785

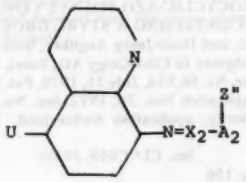
AZO COMPOUNDS

Gerhard Back, Lorrach, Germany, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 377,841, July 9, 1973, abandoned, which is a continuation of Ser. No. 63,034, Aug. 11, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,748
Claims priority, application Switzerland, Aug. 14, 1969, 12432/69
Int. Cl.[2] C09B *45/18, 45/48;* D06P *1/10, 3/02*
U.S. Cl. 260—145 B 17 Claims

1. A chromium complex containing one molecule of each of the following formula:

and



D_1 is phenyl or naphthyl, or phenyl or naphthyl substituted by chloro, bromo, lower alkyl, aryl, lower alkoxy, aryloxy, nitro, sulfo, sulfonamido, sulfonamido substituted by lower alkyl, lower hydroxyalkyl, lower alkoxyalkyl, lower cyanoalkyl, aralkyl, C_5-C_6-cycloalkyl or aryl, lower alkoxyalkylsulfonyl lower hydroxy-, chloro-, cyano-, or alkoxyalkylsulfonyl, arylsulfonyl, arylazo, lower alkanoyl, benzoyl and acylamino, wherein "lower" means "containing 1 to 5 carbon atoms", "aryl" designates naphthyl or phenyl, or phenyl or naphthyl substituted by chloro, bromo, nitro, sulfo, carboxy, lower alkyl, lower alkoxy and acylamino and "acylamino" means $—NH_2$ substituted by lower alkanoyl, lower alkoxycarbonyl, lower alkylsulfonyl, benzoyl, chloro-, nitro- or methylbenzoyl, phenylsulfonyl, chloro-, nitro- or methylphenyl-sulfonyl or chloro, bromo- or sulfatosubstituted lower alkanoyl or alkylsulfonyl, lower alkenoyl or lower alkenoyl substituted by chloro or bromo, chloro- or bromo-substituted triazinyl and pyrimidyl, 2,6-dichloropyrimidine-5-carbonyl, 2,3-dichlorochinoxaline-7-carbonyl-, 1,4-dichlorophthalazine-7-carbonyl;

A_1 and A_2 are each independently phenyl or phenyl substituted by lower alkyl, acetylamino, propionylamino, ethoxycarbonylamino, methylsulfonylamino, benzoylamino, chloro-, nitro- or methyl-benzoylamino, benzoylamino, phthaloylamino, phenylsulfonylamino, chloro-, nitro- or methylphenylsulfonylamino, chloroacetylamino, α,β-dibromopropionylamino, β-sulfatoethylsulfonylamino, acryloylamino, α-bromoacryloylamino, 2,4-dichlorotriazinylamino, 2-chloro-4-methoxytriazinylamino, 2-chloro-4-isopropoxytriazinylamino, 2,4,5-trichloropyrimidylamino, sulfo, $—NH_2$, hydroxy, lower alkanoyl and arylazo, naphthyl or naphthyl substituted by sulfo, hydroxy, acylamino, sulfonamido, $—NH_2$, phenylamino and sulfo- or $—NH_2$ -substituted anilino, or 3-methyl-pyrazolyl bound to the azo group in position 4, carrying the OH-group in position 5 and substituted in position 1 by phenyl or naphthyl or phenyl or naphthyl substituted by chloro, lower alkyl, lower alkoxy, $—NH_2$, nitro, sulfonamido, sulfonamido

substituted by lower alkyl, lower hydroxyalkyl, lower alkoxyalkyl, lower cyanoalkyl, aralkyl, C_5-C_9-cycloalkyl or aryl and lower alkyl-lower hydroxyalkyl-, lower chloroalkyl-, lower alkoxy-alkyl- or lower cyanoalkylsulfonyl, or the residue of acetoacetanilide or acetoacetanilide substituted in the anilide nucleus by lower alkyl, lower alkoxy, sulfo, lower alkyl-, lower hydroxyalkyl-, lower alkoxyalkyl- or lower cyanoalkylsulfonyl, sulfonamido, substituted sulfonamido, chloro or $-NH_2$, wherein "lower", "aryl" and "acylamino" are defined as above; and

U is hydrogen, sulfo, chloro, bromo, nitro, acylamino or arylazo, the meanings of the latter terms being the same as defined above.

3,933,786

HETEROCYCLIC-AZO-PHENYL COMPOUNDS CONTAINING A STYRL GROUP

Richard Peter, and Hans-Joerg Angliker, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

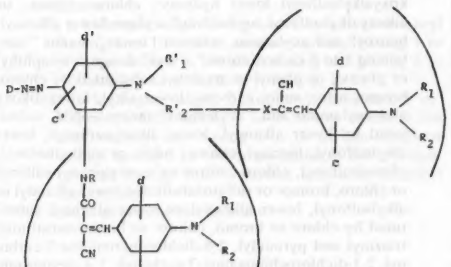
Division of Ser. No. 56,954, July 21, 1970, Pat. No. 3,717,625. This application Nov. 20, 1972, Ser. No. 308,211

Claims priority, application Switzerland, Aug. 5, 1969, 11883/69

Int. Cl.² C09B 29/00

U.S. Cl. 260—156 **14 Claims**

1. A dyestuff of the formula



wherein

X is - phenylene — SO_2—, [—OCO—$N(CH_2C_6H_5)$—CO-] —OCO—, —$N(CH_2C_6H_5)$— or -N(C_1-C_2-alkyl)—OC—;

c, *d* and *d'* each is hydrogen, chlorine, C_1-C_2 alkyl, C_1-C_2 alkoxy, phenyl, phenoxy or phenylthio;

c' is the same as *c*, *d* or *d'* or is bromine, trifluoromethyl [C_{1-10}-hydrocarbylcarbonylamino, C_1-C_6 hydrocarbylsulfonylamino, C_1-C_6-hydrocarbyloxycarbonylamino or C_1-C_8 -hydrocarbylaminocarbonylamino,]acylamino- or N-methyl-acylamino wherein acyl represents formyl, acetyl, propionyl, butyryl, benzoyl, methylsulfonyl, ethylsulfonyl, p-tolylsulfonyl, methoxycarbonyl, phenoxycarbonyl, aminocarbonyl or butylaminocarbonyl

R is hydrogen or C_1-C_2 alkyl,

R_1, R_2, R'_1 and R'_2 each are, independently C_1-C_5-alkyl or C_2-C_5 oxaalkyl and C_1-C_5-alkyl or C_2-C_5 oxaalkyl substituted by chlorine, fluorine, hydroxy, C_1-C_5 alkylcarbonyloxy cyano, bromine, phenyl, phenoxy, phenylmercapto, dichlorophenylmercapto, methoxycarbonyl-thienyl-2-carbonyloxy, benzoyloxy, methoxycarbonyl-benzoyloxy, methoxy-benzoyloxy, C_1-C_5-alkylaminocarbonyloxy, phenylaminocarbonyloxy, C_1-C_5-alkylaminocarbonylamino, C_1-C_5-alkoxycarbonyloxy or C_1-C_5-alkoxycarbonyl,

m and *n* are each 0 or 1, not only of said *m* and *n* being zero at any one time, and with the proviso that when *m* is 1, R^o_2 represents C_2-C_4 alkylene or C_3-C_4, oxaalkylene, said alkylene and oxaalkylene being unsubstituted or substituted by chloro, and

D is selected from the group consisting or thiazolyl, thiadiazolyl, benzthiazolyl, isothiazolyl, pyrazolyl, indazolyl, pyridyl, quinolyl, benzisothiazolyl and triazolyl which is unsubstituted or substituted with one to three substituents selected from the group consisting of cyano lower alkyl, lower alkoxy, chloro, thiocyano, nitro, carbethoxy, methylsulphonyl, benzyl, phenyl, methoxyphenyl, chlorophenyl and pyridyl-(2); and the N-methyl chloride or N-methyl methylsulfate quaternary salt thereof.

3,933,787

SUBSTITUTED 4-(2-BENZOTHIAZOLYL)PHENYLAZO DYES HAVING A QUATERNARY AMMONIUM, HYDRAZINIUM OR OPTIONALLY SUBSTITUTED AMINO SUBSTITUENT

Helmut Moser, Reinach, Basel-Land, Switzerland, assignor to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

Division of Ser. No. 790,903, Jan. 10, 1969

This application Jan. 12, 1973, Ser. No. 323,300

Int. Cl.² C09B 29/10, 29/32, 29/38; D21H 1/46

U.S. Cl. 260—158 **14 Claims**

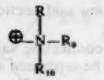
1. A dye of the formula

wherein

B_2 is hydrogen or methyl,

M is

or



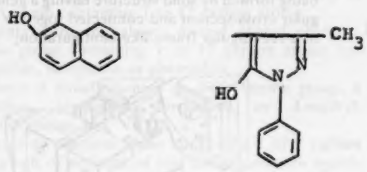
wherein each of R_9 and R_9 is independently methyl, ethyl or 2-hydroxyethyl,

R_{10} is methyl, ethyl, 2-hydroxyethyl or 2-carbamoylethyl,

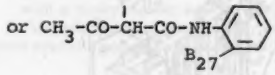
each of R_{11} and R_{12} is independently hydrogen, methyl, ethyl or 2-hydroxyethyl, and

$A^{\ominus}$ is an anion,

X is



or



wherein B_{27} is hydrogen, methyl or methoxy, and *m* is 1 to 3.

3,933,788

POLYSACCHARIDE AND BACTERIAL FERMENTATION PROCESS FOR ITS PREPARATION

Kenneth Suk Kang; George T. Veeder, III, and Danny D. Richey, all of San Diego, Calif., assignors to Kelco Company, San Diego, Calif.

Continuation-in-part of Ser. No. 197,941, Nov. 11, 1971, abandoned. This application June 26, 1973, Ser. No. 373,724

Int. Cl.² C08B *37/00*

U.S. Cl. 260—209 R **1 Claim**

1. Heteropolysaccharide-10, said heteropolysaccharide containing about 3% by weight of protein and about 97% by weight carbohydrate, the carbohydrate portion of which contains about 19% by weight of a uronic acid, about 39% by weight of glucose, about 29% by weight of galactose, and about 13% by weight of fucose, said heteropolysaccharide being compatible with Methylene Blue chloride dye, being substantially insoluble in dimethylsulfoxide and soluble in water, having an acetyl content of about 4.5%, and a specific rotation of $[\alpha]_D = +106°$ (c 0.25, H_2O).

3,933,789

EXTRACTION OF STEROLINS FROM PLANT MATERIAL

Karl Heinrich Pegel, Durban, South Africa, assignor to Roelof Wilke Liebenberg, Johannesburg, South Africa

Filed Mar. 5, 1973, Ser. No. 338,057

Claims priority, application South Africa, Mar. 17, 1972, 72/1855

Int. Cl.² C07J *9/00*

U.S. Cl. 260—210.5 **5 Claims**

1. In a method for manufacturing a sterolin-rich product consisting essentially of the steps of, comminuting a plant material containing sterolins, and deactivating the sterolin-specific degradative enzymes systems by heating the material at a stage not later than immediately following comminution to a temperatuare of at least 60°C.: the improvement comprising extracting the sterolins from the comminuted material in aqueous solution by boiling the comminuted material in water for a continuous period of at least thirty minutes, separating the extract solution from the comminuted material, and concentrating the extract solution.

3,933,790

PHOSPHORYLXYLOSTASIN

Seizi Igarasi, and Makoto Kida, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

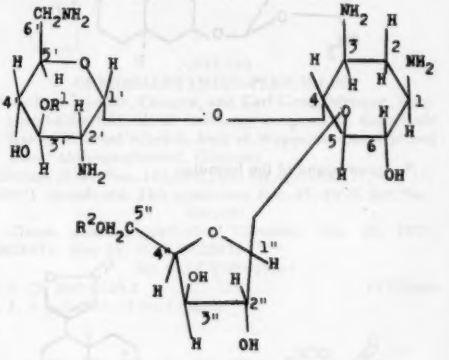
Filed July 8, 1974, Ser. No. 486,454

Claims priority, application Japan, July 9, 1973, 48-77260

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **3 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein R^1 and R^2, independently of each other, represent hydrogen or phosphono, with the proviso that R^1 and R^2 are not both hydrogen.

3,933,791

OBTENTION OF DIGITOXIGENIN FROM NERIIFOLIN AND 2'-ACETYLNERIIFOLIN

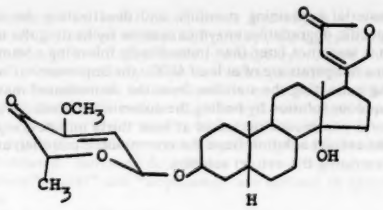
Joseph M. Muchowski, and Jose Iriarte, both of Mexico D. F., Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sept. 16, 1974, Ser. No. 506,362

Int. Cl.² C07J *19/00*

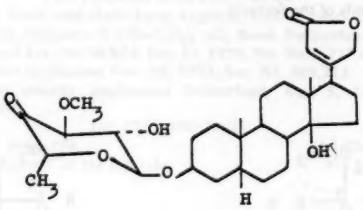
U.S. Cl. 260—210.5 **9 Claims**

1. A process for obtaining digitoxigenin which consists essentially of hydrolyzing a compound of the formula:

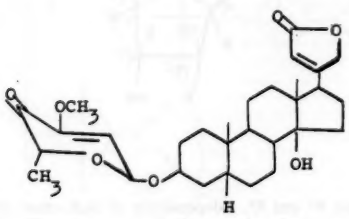


with dilute sulfuric acid in methanol solution and separating the digitoxigenin thus obtained.

8. A compound of the formula:



9. A compound of the formula:



3,933,792

PLATE AND FRAME TYPE FILTERING APPARATUS

John R. Schneider, 26 Cove Road, Belvedere, Calif. 94920

Continuation-in-part of Ser. No. 282,070, Aug. 21, 1972, Pat. No. 3,850,812. This application Nov. 4, 1974, Ser. No. 520,233. The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.[2] B01D 25/12

U.S. Cl. 210—231 5 Claims

1. A liquid filtering apparatus comprising:

a plurality of plate and frame sections arranged in an alternating sequence;

means for supporting said sections in a generally upright vertical position;

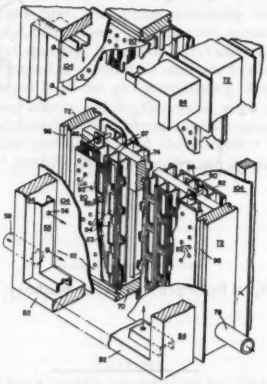
linking means for connecting said sections together while allowing them to be separated a predetermined amount to facilitate the insertion of filter media between adjacent plate and frame sections;

controllable actuator means for pressing said sections together when filtering is being accomplished and for separating the sections when filter media is being changed;

an inlet conduit for supplying liquid to be filtered and means for connecting it in parallel to said frame sections;

an outlet conduit for removing filtered liquid connected in parallel to said plate sections;

all of said plate and said frame sections having peripheral members surrounding a central space, said members being formed by solid structure having a generally rectangular cross-section and connected together at their ends in a rectangular frame-like configuration;



base means in each plate section for supporting a layer of filter media;

all of said frame sections having hollow peripheral cavities within said central space with openings spaced along the inner surfaces of said cavities communicating with said central space;

said hollow peripheral cavities of said frame sections being formed by channel structure having a generally U-shaped cross-section joined at the open end thereof to the interior surfaces of said peripheral members and extending along substantially three sides of said peripheral members;

said inlet conduit communicating with a fluid conduit defined by the interior of said frame section channel structure in combination with the interior surfaces said peripheral members enclosed thereby;

said outlet conduit communicating with the central space defined by said plate section peripheral member.

3,933,793

THERAPEUTICALLY ACTIVE 2-AMINOALKYLTHIO-3H-1.5-BENZODIAZEPINES AND PROCESS FOR PREPARING THEM

Dante Nardi; Elena Massarani, both of Milan, and Ludwig Degen, Rome, all of Italy, assignors to Recordati S.A. Chemical and Pharmaceutical Company, Chiasso, Switzerland

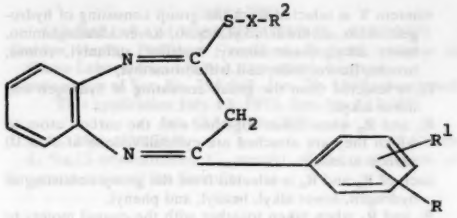
Filed Oct. 10, 1972, Ser. No. 296,045

Claims priority, application Italy, Oct. 19, 1971, 30018/71; May 18, 1972, 24509/72

Int. Cl.[2] C07D 243/12

U.S. Cl. 260—239 BD 15 Claims

1. A compound having the following formula



wherein

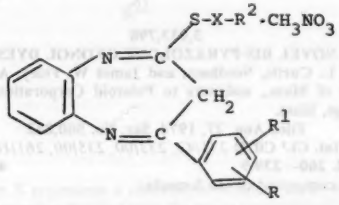
R represents hydrogen, halogen, methoxy, phenylthio or alkythio group containing 1 to 12 carbon atoms;

R^1 represents hydrogen, halogen, methyl, phenyl, phenoxy, alkylthio group containing 1 to 12 carbon atoms, cyclohexylthio, benzylthio or phenylthio;

R^2 represents a dimethylamino or diethylamino group, a morpholino, piperidino pyrrolidino or 4-methylpiperazino group; and

X represents an alkylene chain containing 2 or 3 carbon atoms; a salt of addition of said compound with hydrochloric acid, citric acid or tartaric acid, and a quaternary ammonium salt of said compound formed by reaction with a methyl halide, benzyl halide or methyl nitrate.

2. Methylnitrates of 2-aminoalkylthio-3H-1,5-benzodiazepines according to claim **1** having the formula



wherein R, R^1, R^2 and X have the same meanings as in claim **1**.

3,933,794

2-(2-ALKYNYLAMINO)-3H-1,4-BENZODIAZEPINES

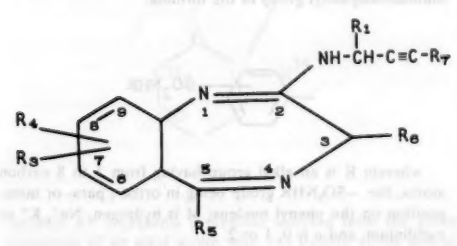
Jackson B. Hester, Jr., Galesburg, Mich., and Arthur R. Hanze, deceased, late of Kalamazoo, Mich. (by Janice W. Hanze, administratrix), assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 169,091, Aug. 4, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,510

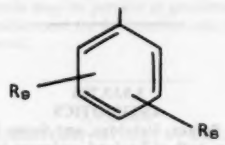
Int. Cl.² C07D *243/20, 401/04*

U.S. Cl. 260—239 BD **3 Claims**

1. A compound of the formula:



wherein R_1 and R_6 are each selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; R_3 and R_4 are each selected from the group consisting of hydrogen, halogen, nitro, trifluoromethyl, alkylthio in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive; R_5 is selected from the group consisting of pyridyl and a phenyl radical of the formula



in which R_8 and R_9 each have the same meaning as given above for R_3 and R_4; and R_7 is selected from the group consisting of hydrogen, methyl and ethyl.

3,933,795

UREIDOACETAMIDO-PENICILLINS

Hans Disselnkotter, Cologne, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Hans-Bodo Konig; Wilfried Schrock, both of Wuppertal-Elberfeld and Bayer Aktiengesellschaft, Germany

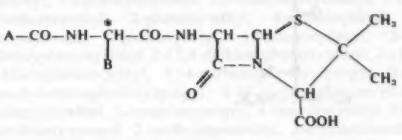
Division of Ser. Nos. 145,809, , and Ser. No. 145,877, May 21, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,187

Claims priority, application Germany, May 25, 1970, 2025414; May 25, 1970, 2025415

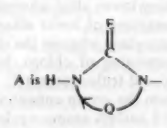
Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **37 Claims**

1. A penicillin of the formula:

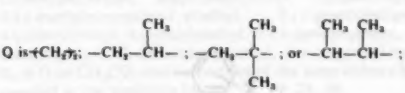


or a pharmaceutically acceptable non-toxic salt thereof wherein



wherein

E is oxygen or sulphur;



B is thienyl, phenyl or phenyl substituted by lower alkyl, mono- or di-halogen, lower alkoxy, lower alkylthio, hydroxy or methylcarbonylamino; and

C can have either of the two possible R- and S- stereoisomeric configurations or it can be a mixture of such diastereomers.

3,933,796

ANTIBIOTICS

Arthur Coates Parker, Uxbridge, and Susan Elizabeth Staniforth, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed June 11, 1974, Ser. No. 478,309

Claims priority, application United Kingdom, June 15, 1973, 28690/73

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **1 Claim**

1. An anhydrate of ampicillin having an infrared spectrum substantially as characterised in FIG. 1 of the accompanying drawings.

3,933,797

6-[α-(ω-QUANIDINOALKANOYLAMIDO)ACYLAMIDO]PENICILLANIC ACIDS

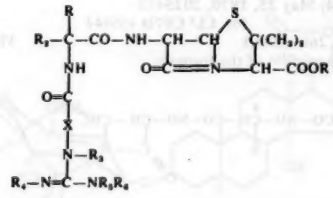
Ernest S. Hamanaka, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 228,344, Feb. 22, 1972, Pat. No. 3,870,709. This application Sept. 23, 1974, Ser. No. 508,070

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **7 Claims**

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein R is selected from the group consisting of hydrogen and acyloxy lower alkyl wherein acyloxy is selected from the group consisting of lower alkanoyloxy, benzoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy and trifluoromethyl;

R_1 is selected from the group consisting of hydrogen, alkyl of from 1 to 14 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, 1,4-cyclohexadienyl, naphthyl, benzyl, phenethyl, furyl, thienyl, and

wherein Y is selected from the group consisting of hydrogen, nitro, di(lower alkyl)amino, lower alkanoylamino, lower alkyl, lower alkoxy, hydroxy, sulfamyl, chloro, bromo, fluoro, iodo, and trifluoromethyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_1 and R_2 when taken together with the carbon atom to which they are attached are cycloalkylidene of 3 to 10 carbon atoms;

each of R_3 and R_4 is selected from the group consisting of hydrogen, lower alkyl, benzyl, and phenyl;

R_4 and R_5 when taken together with the quanyl moiety to which they are attached form a 5-membered heterocyclic ring selected from the group consisting of 2-imidazolyl, and 2-(2-imidazolinyl) and

X is selected from the group consisting of alkylene having from 1 to 7 carbon atoms, phenylene, cycloalkylene having from 3 to 9 carbon atoms, propenylene whose $-CH_2$ group is bound to the adjacent nitrogen; vinylenephenylene, methylene oxyphenylene and phenylenemethylene, each of whose phenylene group is bound to the adjacent nitrogen.

3,933,798

NOVEL BIS-PYRAZOLONE OXONOL DYES

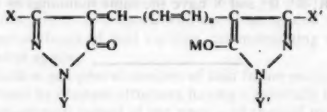
Harris L. Curtis, Needham, and James W. Foley, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 27, 1974, Ser. No. 500,842

Int. Cl.² C07D *231/42, 233/00, 235/00, 261/16*

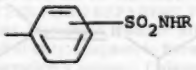
U.S. Cl. 260—239.9 **4 Claims**

1. A compound of the formula:



wherein X and X′ are the same and each represents an ester group of the formula:

wherein Z is hydrogen, hydroxy or lower alkoxy and *m* is the integer 2 or 3; Y and Y′ are the same and represent an alkyl sulfonamidophenyl group of the formula:



wherein R is an alkyl group having from 3 to 8 carbon atoms, the $-SO_2NHR$ group being in ortho-, para- or meta-position on the phenyl nucleus; M is hydrogen, Na^+, K^+ or pyridinium; and *n* is 0, 1 or 2.

3,933,799

11β-HALO-9,12-UNSUBSTITUTED-C_{19} -STEROIDS

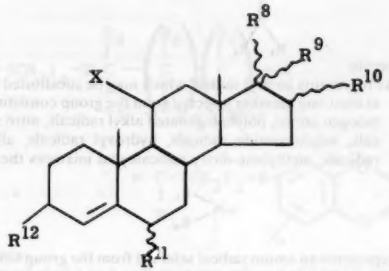
Gordon Hanley Phillipps, Greenford, England, assignor to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 795,065, Jan. 29, 1969, abandoned. This application July 13, 1971, Ser. No. 162,261

Int. Cl.[2] C07J *17/00*

U.S. Cl. 260—239.55 R **8 Claims**

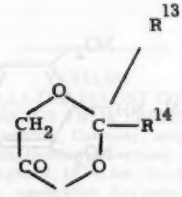
1. 9α,12-unsubstituted C_{19}-steroid of the androstane or pregnane series of the formula:



wherein X represents a chlorine or bromine atom, R^8 represents a member selected from the group consisting of an acetyl group; a hydroxyacetyl group; a hydroxyacetyl group esterified by a group selected from an aliphatic acyl, group having 1–9 carbon atoms in said aliphatic group, a benzoyl group, a phosphate group; and a saturated or unsaturated aliphatic hydrocarbon group which is unsubstituted or substituted by a chlorine atom;

R^9 represents a hydrogen atom, a hydroxy group or an aliphatic acyloxy group having 1–9 carbon atoms in the aliphatic portion, a cycloaliphatic acyloxy group having up to 7 carbon atoms in the cycloaliphatic portion, a benzoyloxy group;

or R^8 and R^9 together represent a grouping of the formula:



wherein R^{13} represents a member selected from the group consisting of an alkyl group with 1–5 carbon atoms and an alkoxy group with 1–5 carbon atoms and R^{14} represents an alkyl group with 1–5 carbon atoms or a hydrogen atom;

R^{10} represents a member selected from the group consisting of a methyl group, a methylene group and a hydrogen atom;

R^{11} represents a member selected from a hydrogen atom, a chlorine atom, a fluorine atom and a methyl group and;

R^{12} represents an oxo group, and wherein the additional double bonds may be present at positions selected from the 1,2-position and the 6,7-position and, dienol ethers or esters thereof.

3,933,800

NEW 3-FORMYLRIFAMYCIN SV DERIVATIVES

Renato Cricchio, Varese, and Giancarlo Lancini, Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

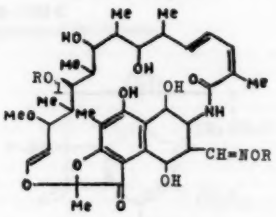
Continuation of Ser. No. 256,297, May 24, 1972, abandoned. This application Oct. 23, 1974, Ser. No. 517,272

Claims priority, application Italy, June 7, 1971, 25493/71; June 24, 1971, 89607/71

Int. Cl.[2] C07D *491/04, 521/00*

U.S. Cl. 260—239.3 P **6 Claims**

1. O-Substituted oximes of 3-formylrifamycin SV having the formula



(I)

wherein R is selected from the group consisting of 4 to 12 carbon atom alkyl, 4 to 12 carbon atom alkenyl, propynyl, 2-heptyn-1-yl, cyclohexyl, cycloheptyl, 2-methoxyethyl, 2-ethoxyethyl, 2-propoxyethyl, 2-isopropoxyethyl, 2-butoxyethyl, 3-methoxypropyl, 3-ethoxypropyl, 3-propoxypropyl, 3-butoxypropyl, 3-methoxybutyl, 4-methoxybutyl, 4-ethoxybutyl, 4-propoxybutyl, 4-isopropoxybutyl, 2-hydroxyethyl, 4-hydroxy-butyl, 6-hydroxyhexyl, 8-hdyroxyoctyl, 1-carboxyisobutyl, 1-carboxyisopentyl, carboisobutoxymethyl, 1-carboisobutoxyethyl, 2-phenoxy-ethyl, 4-phenoxybutyl, 6-phenoxyhexyl, 8-phenoxyoctyl, 10-phenoxydecyl, 2-(4-hydroxyphenoxy)ethyl, 2-(3,4-dichlorophenoxy)ethyl, 2-(2,6-dichlorophenoxy)ethyl, 3-(4-carboxyphenoxy)propyl, 3-(4-dimethylaminophenoxy)propyl, 4-(4-carboxyphenoxy)butyl, 2-benzyloxyethyl, 3-benzyloxypropyl, 4-benzyloxybutyl, 3-(8-quinolinoxy)propyl, 2-methylaminoethyl, 2-ethylaminoethyl, 3-methylaminopropyl, 3-ethylaminopropyl, 2-dimethylaminoethyl, 2-diethylaminoethyl, 2-dipropylaminoethyl, 2-dibutylaminoethyl, 3-dimethylaminopropyl, 3-diethylaminopropyl, 3-dipropylaminopropyl, 3-dibutylaminopropyl, 4-dimethylaminobutyl, 4-diethylaminobutyl, 4-dipropylaminobutyl, 4-dibutylaminobutyl, 4-bromobenzyl, 2,3,6-trichlorobenzyl, α-carbethoxybenzyl, 2-carboxybenzyl, α-phenylbenzyl, α,α-(diphenyl)benzyl, 4-carboxybenzyl, 2,4-dichlorobenzyl, 2-phenethyl, 3-phenylpropyl, 3-(3-nitro-4-hydroxyphenyl)propyl, 4-carboxyphenethyl, 3-(4-carboxymethoxyphenyl)propyl, 2-(2,6-dimethoxy-4-carboxy-phenyl)-propyl, 3-carboxy-3-phenylpropyl, 4-carboxyphenethyl, α-carboxyphenethyl, 2-pyrrolidinylethyl, 2-piperidinylethyl, 2-(4-methylpiperazine-1-yl)ethyl, 3-(1-piperidino)propyl, 4-(2-furyl)butyl, 4-pyridylmethyl, 3-(4-pyridyl)propyl, 3-(2-thienyl)propyl, 2-(3-isoxazolyl)ethyl, bis-(4-pyridyl)methyl; R_1 is H or CH_3CO; and derivatives of the same oximes hydrogenated in the positions 16, 17; 18, 19; 28, 29.

3,933,801
PROCESS FOR PREPARING RIFAMYCIN S BY HYDROLYSIS OF RIFAMYCIN O

Carmine Pasqualucci, Milan; Giuseppe Scarpitta, Pavia, and Giovanni Bonfanti, Milan, all of Italy, assignors to Archifar Industrie Chimiche Del Trentino S.p.A., Rovereto, Italy

Filed Oct. 24, 1974, Ser. No. 517,834
Claims priority, application Italy, Nov. 29, 1973, 31928/73
Int. Cl.² C07D *515/20, 515/10*
U.S. Cl. 260—239.3 P **4 Claims**

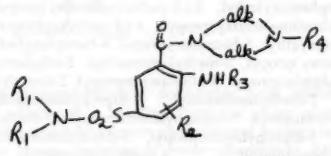
1. A process for preparing a rifamycin S comprising the steps of dissolving rifamycin O at a concentration higher than 60,000γ/ml in a mixture of a water immiscible chlorinated organic solvent and a water miscible alcohol at a temperature in the range of about 0°–30°C and which mixture forms a heterogeneous phase, adding a strong mineral acid in a ratio of about 1:10–1.5:1 by weight to the amount of treated rifamycin O to the mixture then hydrolyzing said rifamycin O in said heterogeneous phase while thoroughly stirring the reaction mass for a time in the range of about 40 minutes to about 3.5 hours and at a temperature in the above range, washing the reaction mass with water and then vacuum concentrating the reaction mass to dryness, the solid obtained then being taken up with a water miscible alcohol, and finally cooling to crystallize rifamycin S.

3,933,802
SULPHAMOYLBENZOIC ACID AMIDES

Pier Giorgio Ferrini, Binningen; Georges Haas, and Alberto Rossi, both of Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 22, 1974, Ser. No. 472,333
Claims priority, application Switzerland, May 28, 1973, 7643/73; Apr. 1, 1974, 4507/74
Int. Cl.² C07D *237/00, 239/00, 241/00, 251/00*
U.S. Cl. 260—239.7 **16 Claims**

1. A 2-amino-5-sulphamoylbenzoic acid amide of the general formula



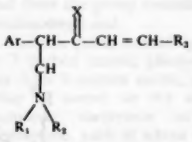
wherein R_1 denotes identical lower alkyl groups with 1 to 4 C atoms, R_2 denotes hydrogen, lower alkyl or lower alkoxy with up to 4 C atoms or halogen up to atomic number 17, R_3 denotes hydrogen, hydroxyl or lower alkyl with 1 to 4 C atoms, R_4 denotes a group of the formula —COOR′ or —COR′ wherein R′ denotes lower alkyl with 1 to 4 C atoms, lower alkenyl with 3 or 4 C atoms or phenyl, benzyl or phenylethyl which are optionally monosubstituted or disubstituted in the phenyl part by lower alkyl or lower alkoxy with 1 to 4 C atoms in each case, halogen up to atomic number 17 or nitro, and alk denotes 1,2-alkylene with 2–4 C atoms.

3,933,803
NEW BETA-AMINOKETONE DERIVATIVES

Elso Manghisi; Giuseppe Cascio, and Liliana Bastianini, all of Milan, Italy, assignors to Instituto Luso Farmaco d'Italia S.r.l., Italy

Filed July 16, 1973, Ser. No. 379,812
Claims priority, application Italy, July 26, 1972, 27473/72
Int. Cl.² C09B *23/00;* **C07C** *97/10*
U.S. Cl. 260—240 G **9 Claims**

1. 5-substituted 1-amino-2-aryl-4-pentene-3-ones and the pharmaceutically acceptable salts thereof of the general formula (I):

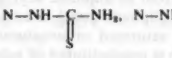


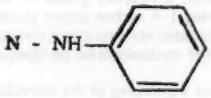
wherein:

Ar represents an aryl radical which may be substituted with at least one member selected from the group consisting of halogen atoms, polyhalogenated alkyl radicals, nitro radicals, sulphonamide radicals, hydroxyl radicals, alkoxy radicals, methylene-dioxy radicals and mixtures thereof;

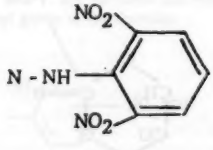
represents an amino radical selected from the group consisting of methyl amino, ethyl amino, propyl amino, isopropyl amino, benzyl amino, phenethyl amino, dimethyl amino, diethyl amino, diethanol amino, dibenzyl amino, morpholine, pyrrolidine, piperidine, 4,4-disubstituted piperidine, N-methyl piperazine, N-hydroxy ethyl piperazine, N-phenyl piperazine, and N-o-methoxy-phenyl piperazine;

X represents a member selected from the group consisting of an oxygen atom and a functional derivative of a carbonyl radical, selected from the group consisting of NOH, N—NH_2, N—NH—CO—NH_2,





and



; and

R_3 represents a radical selected from the group consisting of methyl, ethyl, isopropyl, benzyl, phenethyl, cinnamyl, furyl-vinyl, phenyl, tolyl, xylyl, chloro-phenyl, nitro-phenyl, hydroxyphenyl, carboxy-phenyl, naphthyl, furyl,

nitro-furyl, thienyl, pyrryl, pyridyl, imidazolyl and nitroimidazolyl.

3,933,804

INSECTICIDAL 1,3-BENZODIOXOL DERIVATIVES

Hans-Peter Schelling, Oberwil, and Fritz Schaub, Basel, both of Switzerland, assignors to Sandoz, Ltd., Basel, Switzerland

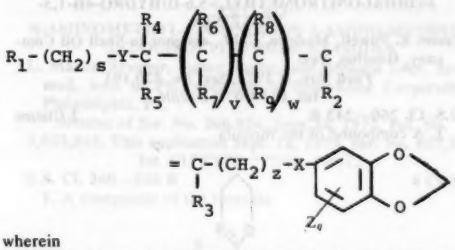
Continuation-in-part of Ser. No. 207,633, Dec. 13, 1971, Pat. No. 3,829,442. This application May 21, 1974, Ser. No. 472,013

Claims priority, application Switzerland, Dec. 14, 1970, 18472/70; Sept. 17, 1971, 13599/71; Oct. 6, 1971, 14521/71; Nov. 11, 1971, 16357/71

Int. Cl.² C07D *317/64*

U.S. Cl. 260—240 H 10 Claims

1. A compound of the formula:

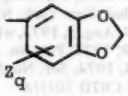


wherein

Z is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 12 carbon atoms, alkoxy of 1 to 5 carbon atoms, alkenyloxy of 2 to 12 carbon atoms, formyl, alkyl carbonyl of 2 to 6 carbon atoms, alkoxy carbonyl of 2 to 6 carbon atoms, mono- or di-alkyl substituted carbamoyl in which each alkyl is of 1 to 5 carbon atoms, alkoxy methylene of 2 to 6 carbon atoms, alkylthio of 1 to 5 carbon atoms, fluorine, chlorine, bromine, cyano or nitro,

q is 0 or 1,

R_1 is cycloalkyl or cycloalkenyl of 4 to 7 carbon atoms, unsubstituted or substituted by alkyl of 1 to 5 carbon atoms or



R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9, which may be the same or different, are each hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 6 carbon atoms,

Y is oxygen or sulfur,

X is oxygen, sulfur, $—OCH_2—$ or $—SCH_2—$,

s, *v* and *w*, which may be the same or different, are each 0 or 1, and

z is 1, 2 or 3.

3,933,805

S(IV)-BENZO-1,2,4-THIADIAZINE COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Erich Cohnen, Hamburg, Germany, assignor to Biersdorf, Akteingesellschaft, Hamburg, Germany

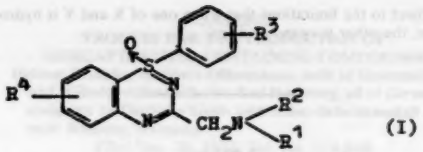
Filed Apr. 22, 1974, Ser. No. 462,593

Claims priority, application Germany, Apr. 30, 1973, 2321786

Int. Cl.² C07D *285/24*

U.S. Cl. 260—243 R 12 Claims

1. An S (IV)-benzo-1,2,4-thiadiazine compound of the formula (I)



(I)

in which R^1 is hydrogen, lower alkyl or hydroxy lower alkyl; R^2 is lower alkyl, lower hydroxy alkyl, methoxy lower alkyl, cyclopentyl or cyclohexyl; or R^1 and R^2 together with the nitrogen to which they are attached form a pyrrolidino, piperidino, hexamethylenimino or morpholino radical, R^3 is hydrogen, halogen, lower alkyl, nitro or amino; and R^4 is hydrogen, halogen, lower alkyl, methoxy or diloweralkylamino; and physiologically acceptable acid addition salts of said compound.

3,933,806

CEPHALOSPORIN MICHAEL ADDUCTS

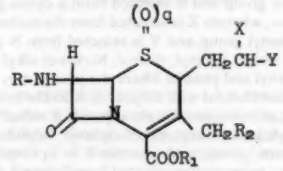
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 17, 1973, Ser. No. 380,011

Int. Cl.² C07D *501/20*

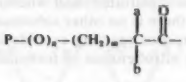
U.S. Cl. 260—243 C 13 Claims

1. A compound of the formula



wherein

R is hydrogen, C_1-C_8 alkanoyl, benzoyl, or a group represented by the formula:



wherein

P is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, phenyl or phenyl substituted by amino, protected amino, halogen, hydroxy, protected hydroxy, C_1-C_4 lower alkyl, or C_1-C_4 lower alkoxy;

a is hydrogen or C_1-C_3 alkyl;

b is hydrogen, C_1-C_3 alkyl, amino, protected amino, hydroxy, or protected hydroxy;

m is 0 or an integer from 1 to 3;

n is 0 or 1;

subject to the limitation that when

n is 1,

p is phenyl or phenyl substituted by amino, protected amino, halogen, hydroxy, protected hydroxy, C_1-C_4 lower alkyl or C_1-C_4 lower alkoxy; and

b is hydrogen or C_1-C_3 alkyl;

R_1 is hydrogen, a carboxylic acid protecting group, or an alkali metal or alkaline earth metal cation;

R_2 is hydrogen, C_2-C_5 alkanoyloxy, or C_1-C_4 alkoxy;

q is 0 or 1; and

X and Y are independently hydrogen, acetyl, benzoyl, carboethoxy, carbomethoxy, cyano, nitro and 2,2,2-trichlorocarboethoxy;

subject to the limitations that when one of X and Y is hydrogen, the other is cyano or nitro.

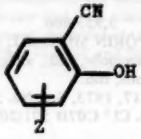
3,933,807

PREPARATION OF CYANOPHENOLS

John Henry Gorvin, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

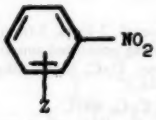
Continuation of Ser. No. 255,186, May 19, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,912
Claims priority, application United Kingdom, May 21, 1971, 16197/71
Int. Cl.² C07D *279/34*
U.S. Cl. 260—243 A 13 Claims

1. In a process for the preparation of the compound of formula (I)



(I)

wherein Z is a substituent in the 4- or 6-position with respect to the hydroxy group and is selected from a cyano group and a group Y.X —, wherein X is selected from the carbonyl group and the sulphonyl group and Y is selected from N-phenyl-N-(lower alkyl) amino, furanyl, thienyl, N-(lower alkyl) pyrrolyl, cyclopentadienyl and phenyl, where the phenyl may be joined at the 2-position thereof with respect to X to the benzene ring in formula (I) at a position therein adjacent X either by a bond or by a methylene, carbonyl, thio, sulphinyl, sulphonyl, oxy or monoalkylamino group, and wherein Y is optionally substituted by one or more groups selected from halogen, aryl which is selected from the group consisting of phenyl, halogenophenyl, xylyl, salicyl and tolyl, phenoxy lower alkoxy, cyano, trifluoromethyl and carboloweralkoxy and wherein lower alkyl and alkoxy herein have 1 to 4 carbon atoms provided that when Y is N-phenyl-N-(lower alkyl) amino only the phenyl moiety may be substituted; and wherein in the compound of formula (I) there is no other substituent in the benzene ring, which comprises reacting cyanide ions in dipolar aprotic solvent with a nitrobenzene of formula (II)



(II)

wherein Z is a substituent in the 4- or 6-position with respect to the nitro group and is defined as above.

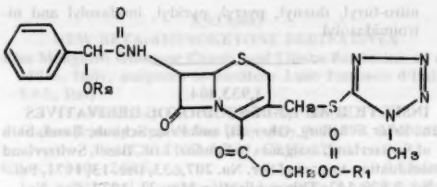
3,933,808

CEPHALOSPORIN ESTERS

William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 20, 1974, Ser. No. 471,528
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C 7 Claims

1. The compound of the formula



wherein:
R_1 is C_1–C_4 alkyl;
R_a is hydrogen or C_1–C_4 alkanoyl.

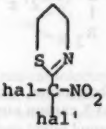
3,933,809

2-(DIHALONITROMETHYL)-5,6-DIHYDRO-4H-1,3-THIAZINES

James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 1, 1974, Ser. No. 520,191
Int. Cl.² C07D *279/06*
U.S. Cl. 260—243 R 2 Claims

1. A compound of the formula



wherein hal represents chlorine, bromine or fluorine, and hal' represents chlorine or bromine.

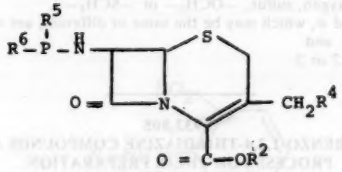
3,933,810

INTERMEDIATES FOR PRODUCING SEMI-SYNTHETIC CEPHALOSPORINS

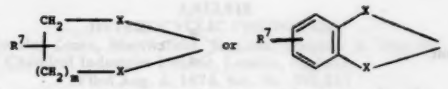
John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 385,024, Aug. 2, 1973, which is a division of Ser. No. 197,142, Nov. 9, 1971, Pat. No. 3,859,298. This application Dec. 18, 1974, Ser. No. 534,004
Int. Cl.² C07D *501/18*
U.S. Cl. 260—243 C 6 Claims

1. A compound having the following formula which is useful as an intermediate for obtaining non-toxic cephalosporins having antibacterial activity against gram positive and/or gram negative microorganisms:



wherein: R^2 is a member selected from the class consisting of hydrogen, alkali metal and a tertiary amine; R^4 is a member selected from the class consisting of hydrogen, (lower)alkanoyloxy containing two to eight carbon atoms, and a quaternary ammonium radical; R^5 and R^6 are each selected from the class consisting of (lower)-alkyl, phenyl, naphthyl, phenyl(-lower)alkyl and naphthyl(lower)-alkyl; and R^5 and R^6 when joined together with the phosphorus atom form the ring:



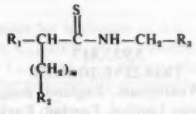
wherein: X is selected from the class consisting of oxygen, methylene and sulfur; *m* is an integer from 1 to 6; R^7 is selected from the class consisting of hydrogen and (lower)alkyl.

3,933,811
N-AMINOMETHYL-2-AMINO(AND 2-AMINO-METHYL)-2-(2-QUINOLYL)-THIOACETAMIDES

L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 266,024, June 26, 1972, Pat. No. 3,853,865. This application Sept. 18, 1974, Ser. No. 507,107
Int. Cl.² C07D *295/10, 295/12*
U.S. Cl. 260—246 B **4 Claims**

1. A compound of the formula:



in which
m is 0 or 1;
R_1 is 2-quinolyl; and
R_2 and R_3 are di-lower alkylamino, N-lower Alkyl-N-phenylamino, piperidino, pyrrolidino or morpoholino
or a pharmaceutically acceptable acid addition salt thereof.

3,933,812
CERTAIN 1,4-BIS-(MORPHOLINO)-2-BUTENE-CONTAINING CONDENSATION PRODUCTS AND THEIR PREPARATION

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 511,759, Oct. 3, 1974, which is a continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application July 7, 1975, Ser. No. 593,736
Int. Cl.² C07D *295/12*
U.S. Cl. 260—246 B **4 Claims**

1. A product formed by the condensation of a mixture of difunctional tertiary amines and a molar quantity of 1,4-dichloro-2-butene that is substantially equal to the molar sum of the mixture of the difunctional tertiary amines, said mixture of difunctional tertiary amines being selected from the group consisting of (a) 1,4-bis-(morpholino)-2-butene and N,N′-di-lower alkyl piperazine, (b) 1,4-bis-(dimethylamino)-2-butene and 1,4-bis-(N-morpholino)-2-butene, and (c) 1,4-bis-(dimethylamino)-2-butene, N,N′-di-lower alkyl piperazine and 1,4-bis-(N-morpholino)-2-butene.

3,933,813
PROCESS FOR THE PRODUCTION OF MERCAPTOETHYL CONTAINING COMPOUNDS

Helmut Beschke; Heribert Offermanns, both of Grossauheim, and Wilhelm-Alfons Schuler, Bad Homburg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Dec. 29, 1972, Ser. No. 319,848
Claims priority, application Germany, Jan. 14, 1972, 2201633
Int. Cl.² C07D *331/02;* **C07C** *149/24, 153/09*
U.S. Cl. 260—247.1 R **17 Claims**

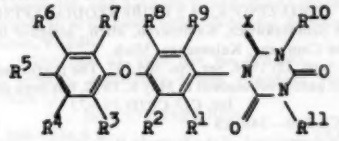
1. A process for the production of a compound containing a mercaptoethyl group comprising reacting an aqueous alkali metal thiocyanate solution containing 126 cc to 500 cc of water per mole of thiocyanate with ethylene oxide to form ethylene sulfide, said reaction being carried out in the presence of an inert water immiscible organic solvent for ethylene sulfide, said solvent having a specific gravity below 1 and being used in an amount of 0.5 to 5 parts by weight per part by weight of thiocyanate, separating the organic phase containing the ethylene sulfide from the aqueous phase and reacting the ethylene sulfide in the organic phase with an ethylene sulfide reactable polar organic compound selected from the group consisting of primary amines, secondary amines, alcohols, mercaptans, carboxylic acids, carboxylic acid anhydrides and carboxylic acid halides.

3,933,814
1-(4-PHENOXYPHENYL)-1,3,5-TRIAZINES

Axel Haberkorn, Wuppertal; Heinrich Kolling, Haan, Rheinland; Eckart Kranz, Wuppertal, and Jurgen Schramm, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 17, 1973, Ser. No. 397,812
Claims priority, application Germany, Sept. 20, 1972, 2246109
Int. Cl.² C07D *251/26*
U.S. Cl. 260—248 NS **22 Claims**

1. A 1-(4-phenoxy-phenyl)-1,3,5-triazine of the formula:



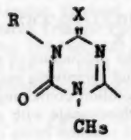
or a pharmaceutically acceptable nontoxic salt thereof wherein
R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are the same or different and are each hydrogen, straight or branched chain lower alkyl, trifluoromethyl, halogen, nitro, cyano, amino, lower alkanoylamine, lower alkoxycarbonylamine, carboxyl, lower alkoxycarbonyl, aminocarbonyl, lower alkylcarbonyl, lower alkylsulphonyl, or aminosulphonyl;
R^{10} is hydrogen, straight or branched chain lower alkyl, cyclohexyl, haloalkyl of one or two carbon atoms in the alkyl moiety and one halo moiety, lower alkoxy lower alkyl, lower alkenyl, lower alkinyl, lower alkoxycarbonyl, thiolower alkylcarbonyl, lower alkoxy, dilower alkylamino, piperidyl, morpholino, benzyl unsubstituted or substituted by one or two halogen moieties, or phenyl unsubstituted or substituted by halogen;
R^{11} is hydrogen or lower alkyl; and
X is oxygen or sulfur.

3,933,815
TRIFLUOROMETHYL TRIAZINES

Hermanus L. Ploeg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

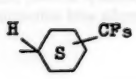
Filed June 24, 1974, Ser. No. 482,792
Int. Cl.[2] C07D 263/46
U.S. Cl. 260—248 NS 6 Claims

1. A compound of the formula

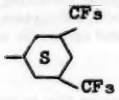


I

where
R is



or



;

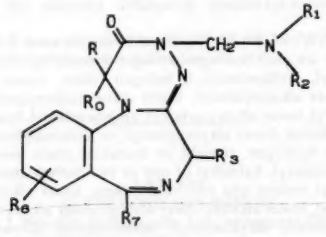
R_1 is $-OCH_3$, $-SCH_3$, $-NHCH_3$, or $-N(CH_3)_2$; and X is oxygen or sulfur.

3,933,816
3-(SUBSTITUTED AMINOMETHYL)-7-SUBSTITUTED-3,5-DIHYDRO-AS-TRIAZINO[4,3-A][1,5]BENZODIAZEPINES

Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 12, 1974, Ser. No. 505,507. The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.[2] C07D 251/72
U.S. Cl. 260—248 AS 15 Claims

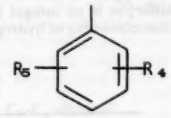
1. A compound of the formula II



II

wherein R, R_6, and R_3 are hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_1 and R_2 are alkyl defined as above, or the group

together is pyrrolidino, piperidino, morpholino and N-methylpiperazino; wherein R_7 is 2-pyridyl or a phenyl radical of the formula



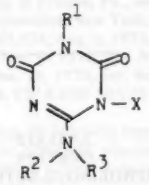
wherein R_4 is hydrogen, fluoro, or chloro; wherein R_5 is hydrogen or fluoro, with the proviso that R_5 is not fluoro, when R_4 is chloro; and wherein R_6 is hydrogen, chloro, fluoro, bromo, trifluoromethyl, or nitro.

3,933,817
TRIAZINE-DIONES

Ian Trevor Kay, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 15, 1974, Ser. No. 515,090
Claims priority, application United Kingdom, Nov *, 1973, 50827/73; Feb. 15, 1974, 6959/74
Int. Cl.[2] C07D 251/46
U.S. Cl. 260—249.5 3 Claims

1. A triazine-dione compound of the formula:



wherein R^1 is an alkyl radical of 1 to 8 carbon atoms and either (a) R^2 is a carboxylic acyl radical of formula $R^4.CO$ — wherein R^4 is a carboxy group, an alkoxycarbonyl group, an alkoxy group of 1 to 6 carbon atoms, an alkyl group of 1 to 6 carbon atoms, or a phenyl radical and R^3 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms, or (b) R^2 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms and R^3 together with the group X, forms a divalent radical Z linking the exocyclic nitrogen atom to which R^3 is attached to the nitrogen atom in the triazine ring, so as to form a second 5- or 6-membered ring, the radical Z being selected from the group consisting of oxalyl (—CO.CO—), 1,2-dihydroxyethylene (—CH(OH)—CH(OH)—), ethylene ($—CH_2CH_2—$), trimethylene ($—CH_2CH_2CH_2—$), and radicals of the formula $—CH_2NR^5CH_2—$ wherein R^5 is phenyl, an alkyl group of 1 to 10 carbon atoms or hydrogen; and X is a hydrogen atom, a salt-forming cation or an alkyl radical of 1 to 6 carbon atoms, or together with R^3 forms the divalent group Z.

3,933,818
HETEROCYCLIC COMPOUNDS

Geraint Jones, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

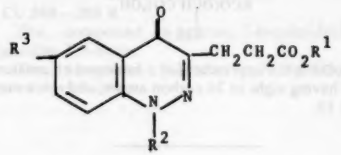
Filed Aug. 6, 1974, Ser. No. 495,217

Claims priority, application United Kingdom, Sept. 7, 1973, 42173/73

Int. Cl.² C07D *237/28*

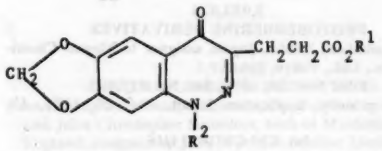
U.S. Cl. 260—250 C **5 Claims**

1. A cinnoline derivative of the formula:-



Ia

or



Ib

wherein R^1 stands for hydrogen or a C_{1-6}-alkyl, R^2 stands for hydrogen or a C_{1-5}-alkyl or C_{3-5}-alkenyl, and R^3 stands for hydrogen or a C_{1-5}-alkyl, C_{1-5}-alkoxy, phenyl or benzyloxy, or a non-toxic pharmaceutically-acceptable salt thereof.

3,933,819
FLUORINATED AROMATIC AND HETEROCYCLIC SULFIDES

Sameeh Said Toukan, Phoenixville, and Murray Hauptschein, Glenside, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 171,325, Aug. 21, 1971. This application Sept. 12, 1973, Ser. No. 396,649

Int. Cl.² C07D *239/00*

U.S. Cl. 260—251 **6 Claims**

1. A fluorinated alkyl sulfide compound represented by the structure $[R_f(CH_2)_nS]_zQ$ where R_f is selected from the class consisting of perfluoroalkyl, perfluoroisoalkoxyalkyl and perfluoromonochloroalkyl radicals having from 5 to 13 carbon atoms, Q is selected from the group consisting of pyridyl, pyrimidyl, triazinyl, piperazinyl, piperidinyl and quinolinyl, n is an integer of 2 or 3, and z is 1 or 2.

3,933,820
5-NITROPYRIMIDINES

Hamish Christopher Swan Wood, Bearsden, Scotland, and Kyuji Ohta, Tokyo, Japan, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

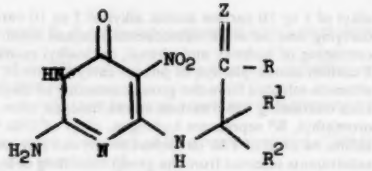
Filed July 30, 1973, Ser. No. 383,699

Claims priority, application United Kingdom, Aug. 1, 1972, 35816/72; Feb. 1, 1973, 5190/73

Int. Cl.² C07D *239/22*

U.S. Cl. 260—256.4 C **12 Claims**

1. A compound of the formula



wherein R is phenoxyloweralkyl or phenoxy lower alkyl which is substituted by one or more lower alkoxy, amino, lower alkyl, hydroxyl or halogen and R^1 and R^2 are the same or different and each is lower alkyl or R^1 and R^2, having in total 4 to 6 carbon atoms, form a spirocycloalkyl group together with the carbon atom substituted by said R^1 and R^2 Z is an oxygen atom or a protecting group therefore, or a tautomeric form thereof, and wherein in the above lower alkyl and lower alkoxy have 1 to 4 carbon atoms.

3,933,821
DIRECT PRODUCTION OF 1,9-ANTHRAPYRIMIDINE-2-CARBOXYLIC ACID-1′-ANTHRAQUINONYLAMIDE IN PIGMENTARY FORM

Heinrich Hiller, Mannheim; Wolfgang Jentzsch, Frankenthal, and Alfred Schuhmacher, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 19, 1973, Ser. No. 426,367

Claims priority, application Germany, Jan. 2, 1973, 2300019

Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 Q **7 Claims**

1. A process for the direct production of 1,9-anthrapyrimidine-2-carboxylic acid-1′-anthraquinonylamide in pigmentary form which comprises the step of condensing 1,9-anthrapyrimidinecarboxylic acid chloride with 1-aminoanthraquinone in N-methylpyrrolidone.

3,933,822
AZAPURINONES

Barbara Joyce Broughton, Croydon; Bryan John Large, Ilkley; Stuart Malcolm Marshall, Stanford-le-Hope; David Lord Pain, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, all of England, assignors to May & Baker Limited, Essex, England

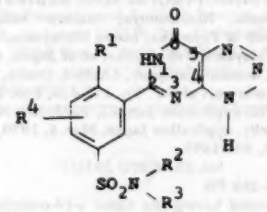
Filed June 11, 1974, Ser. No. 478,387

Claims priority, application United Kingdom, June 12, 1973, 27920/73

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.5 R **13 Claims**

1. An 8-azapurin-6-one derivative of the formula:



wherein R^1 represents hydroxy, or alkoxy or alkylthio each containing 1 to 10 carbon atoms, R^2 represents hydrogen,

alkyl of 1 to 10 carbon atoms, alkyl of 1 to 10 carbon atoms carrying one or more substituents selected from the group consisting of hydroxy and phenyl, cycloalkyl containing 3 to 8 carbon atoms, phenyl, or phenyl carrying one or more substituents selected from the group consisting of alkyl or alkoxy each containing 1 to 6 carbon atoms, halogen, nitro and trifluoromethyl, R^3 represents hydrogen, alkyl of 1 to 10 carbon atoms, or alkyl of 1 to 10 carbon atoms carrying one or more substituents selected from the group consisting of hydroxy and phenyl, or cycloalkyl containing 3 to 8 carbon atoms, and R^4 represents hydrogen, methyl or ethyl, or a pharmaceutically acceptable salt thereof.

3,933,823

ISOXAZOLOPYRIDINE KETONE DERIVATIVES

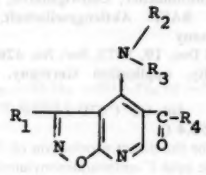
Theodor Denzel, Nurnberg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 129,198, March 29, 1971, Pat. No. 3,736,327. This application Mar. 5, 1973, Ser. No. 337,776

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 BC **5 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or lower alkyl;

is R_7-piperidino or R_7-piperazinyl; R_4 is lower alkyl, cyclolower alkyl or phenyl; and R_7 is hydrogen, lower alkyl or hydroxy-lower alkyl, and physiologically acceptable acid addition salts thereof.

3,933,824

PIPERAZINOBUTYROPHENONE DERIVATIVES

Hisao Yamamoto, Nishinomiya; Masaru Nakao; Kikuo Sasajima, both of Toyonaka; Isamu Maruyama, Minoo, and Shigenari Katayama, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 119,426, Feb. 26, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,372

Claims priority, application Japan, Mar. 6, 1970, 45-19458; May 14, 1970, 45-41495

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PH **2 Claims**

1. A compound having the name γ-(4-o-methoxyphenylpiperazino)-2-acetylamino-4-fluorobutyrophenone or its non-toxic pharmaceutically acceptable acid addition salt.

2. A compound having the name γ-(4-o-methoxyphenylpiperzino)-2-amino-4-fluorobutyrophenone or its non-toxic pharmaceutically acceptable acid addition salt.

3,933,825

AMINE SALTS OF ACYL LACTYLIC ACIDS

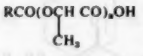
Anthony J. Fiscella, Holmdel, N.J., and Leonard Mackles, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 14, 1973, Ser. No. 360,238

Int. Cl.² C07D *211/12*

U.S. Cl. 260—268 R **4 Claims**

1. Water soluble, organic solvent soluble piperidine or pyrralidine salts of acyl lactylic acids of formula



wherein RCO is the acyl radical of a saturated or unsaturated fatty acid having eight to 24 carbon atoms, and *n* is a number from 1 to 10.

3,933,826

PROTOBERBERINE DERIVATIVES

Tetsuji Kametani, Sendai, Japan, assignor to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1973, Ser. No. 417,492

Claims priority, application Japan, Nov. 20, 1972, 47-115706

Int. Cl.² C07D *215/16*

U.S. Cl. 260—287 C **1 Claim**

1. A protoberbine derivative which is 5,6,13,13a-tetrahydro-2,3,11-trimethoxy-10-acetoxy-8H-dibenzo [a,g]quinolizine.

3,933,827

9-ACYLOXY-5,11-DIMETHYL-6H-PYRIDO[4,3-B]CARBAZOLES

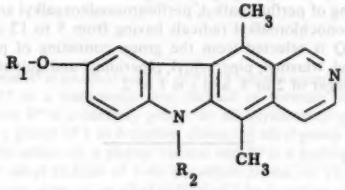
Arnold Brossi, Riehen, Switzerland; Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 29, 1974, Ser. No. 518,308

Int. Cl.² C07D *471/04*

U.S. Cl. 260—287 C **13 Claims**

1. A compound of the formula



wherein R_1 is alkanoyl of 1 to 18 carbon atoms, alicyclic alkanoyl of 3 to 12 carbon atoms, benzoyl, 3,4,5-trimethoxybenzoyl, 4-chlorobenzoyl, or 4-methylbenzoyl and R_2 is hydrogen or lower alkyl of 1 to 7 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

3,933,828
QUINONE DERIVATIVES AND COMPOSITIONS CONTAINING THE SAME

Hideo Kano, Ibaraki; Masaru Ogata, Kobe, and Hisajiro Yukinaga, Kusatsu, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 220,708, Jan. 25, 1972, Pat. No. 3,855,168. This application Nov. 29, 1973, Ser. No. 419,970
Claims priority, application Japan, Feb. 9, 1971, 46-5389; Feb. 9, 1971, 46-5390; Feb. 9, 1971, 46-5393; Mar. 31, 1971, 46-19410
Int. Cl.² C07D 215/20
U.S. Cl. 260—288 R **2 Claims**

1. The compound 6-hydroxy-7-benzimidoyl-5,8-dihydroquinoline-5,8-dione.

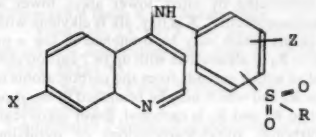
2. The compound 6-benzimidoyl-7-hydroxy-5,8-dihydroquinoline-5,8-dione.

3,933,829
4-AMINOQUINOLINE DERIVATIVES

John Leheup Archibald, Windsor; John Terence Arnott Boyle, and John Christopher Saunders, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Aug. 22, 1974, Ser. No. 499,746
Int. Cl.² C07D 215/44
U.S. Cl. 260—288 R **9 Claims**

1. A compound selected from those of the formula



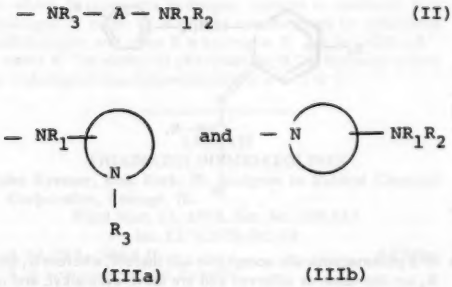
(I)

and their pharmaceutically acceptable acid addition salts, where

i. x is selected from chlorine and bromine;

ii. Z is a member of the group consisting of hydrogen, lower alkoxy, nitro and chlorine;

iii. R is a member of the group consisting of



(II)

(IIIa) (IIIb)

wherein

a. in formula II, A represents a chain of 1 to 5 methylene groups;

b. in formulae IIIa and IIIb the ring denotes a piperidine or pyrrolidine ring;

c. R_1 is a member of the group consisting of hydrogen and lower alkyl;

d. R_2 represents a member of the group consisting of lower alkyl and benzoyl; and

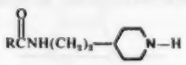
e. R_3 represents a member of the group consisting of hydrogen, cycloalkyl of 5 to 7 carbon atoms, lower alkyl and benzyl.

3,933,830
PROCESS FOR THE SYNTHESIS OF 4-(2-PYRIDYLAMIDO ETHYL) PIPERIDINES

Wayne E. Barth, East Lyme, and Donald E. Kuhla, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Sept. 10, 1974, Ser. No. 504,826
Int. Cl.² C07D 211/02
U.S. Cl. 260—293.52 **14 Claims**

1. A process for preparing a 4-(2-pyridylamidoethyl)piperidine of the structure



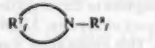
wherein R is selected from the group consisting of 3-(2-methoxy) pyridyl, 3-(2-ethoxy)pyridyl and 2-(4-chloro)pyridyl comprising contacting the corresponding 4-(2-pyridylamidoethyl)pyridine in reaction-inert solvent with hydrogen at about 25 to 75 psig. and about 15° to 40°C. in the presence of noble metal catalyst and a substantially equimolar portion of acid until reaction is substantially complete.

3,933,831
PERFLUORINATED TERTIARY AMINES

Ralph J. De Pasquale, and Keith B. Baucom, both of Gainesville, Fla., assignors to PCR, Inc., Gainesville, Fla.

Filed Nov. 7, 1973, Ser. No. 413,440
Int. Cl.² C07D 211/00
U.S. Cl. 260—293.51 **2 Claims**

1. Perfluorinated tertiary amine of the formula



wherein R^7_f

a. is $-C_{n3}F_{2n3'}$, wherein n_3 is 2–20, and R^8_f is a perfluorinated aryl group, wherein any substituents on the aryl ring are perfluorinated alkyl substituents, wherein R^8_f contains about 6–12 carbon atoms.

3,933,832
N-(1-(ω-PHENYL-ALKYL)-PIPERIDYL-4)-N-(α-PYRIDYL)-CARBOXYLIC ACID AMIDES AND SALTS THEREOF

Adolf Langbein; Herbert Merz, both of Ingelheim am Rhein; Gerhard Walther, and Klaus Stockhaus, both of Bingen (Rhine), all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

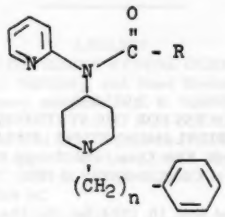
Filed Aug. 14, 1974, Ser. No. 497,455

Claims priority, application Germany, Aug. 20, 1973, 2341965

Int. Cl.² C07D 211/58

U.S. Cl. 260—293.69 **3 Claims**

1. A compound of the formula



wherein

R is alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 2 carbon atoms or phenyl, and

n is an integer from 2 to 4, inclusive,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,933,833
PHENYL -THIOUREA, -CARBOTHIOAMIDE AND -CARBONOTHIOAMIDE DERIVATIVES

Donald L. Trepanier, and Thomas C. Britton, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 30, 1974, Ser. No. 474,506

Int. Cl.² C07D 211/42

U.S. Cl. 260—293.73 **9 Claims**

1. A compound selected from the group consisting of N-(2,4-dimethylphenyl)-3-hydroxy-1-pyrrolidinecarbonothioamide, N-(2,4-dimethylphenyl)-3-hydroxy-1-piperidinecarbonothioamide, N-(2,4-dimethylphenyl)-N′-(2-methoxyethyl)thiourea, N-(2,4-dimethylphenyl)-N′-(2-ethoxyethyl)thiourea, 2-(2-hydroxy-2-methylpropyl)-2-methyl-N-phenylhydrazinecarbothioamide, N-(2,4-dimethylphenyl)-1-(2-hydroxyethyl)hydrazinecarbothioamide, N-(2,2-dimethoxyethyl)-N′-(2,4-dimethylphenyl)thiourea and N-(2,4-dimethylphenyl)-N′-(2-hydroxy-2-phenylethyl)thiourea.

3,933,834
UNSYMMETRICAL ESTERS OF N-SUBSTITUTED 1,4-DIHYDROPYRIDINE 3,5-DICARBOXYLIC ACID

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

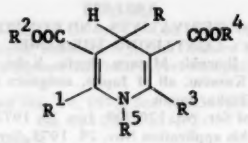
Continuation-in-part of Ser. No. 336,605, Feb. 28, 1973, Pat. No. 3,883,540. This application Aug. 13, 1974, Ser. No. 496,972

Claims priority, application Germany, June 3, 1972, 2210672

Int. Cl.² C07D 213/55

U.S. Cl. 260—294.8 D **11 Claims**

1. A compound of the general formula:



in which

R is thienyl or furyl, unsubstituted or substituted by lower alkyl, lower alkoxy or halo;

R^1 and R^3, independent of the other, is hydrogen methyl, ethyl or propyl;

R^2 and R^4 are different from one another and are lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy(lower alkyl) or cycloalkyl of 3 to 6 carbon atoms, unsubstituted or substituted by hydroxy;

R^5 is lower alkyl or benzyl, or a pharmaceutically acceptable acid addition salt thereof.

3,933,835
NEW ALIPHATICALLY SUBSTITUTED ARYL-CHALCOGENO-HYDROCARBON DERIVATIVES

Georges Haas, Oberwil; Roland Jaques, Allschwil; Alberto Rossi, Oberwil, and Martin Ruegg, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,192

Claims priority, application Switzerland, Nov. 1, 1972, 15923/72; Sept. 18, 1973, 13386/73

Int. Cl.² C07D 213/55

U.S. Cl. 260—295.5 T **11 Claims**

1. A compound of the formula

$R_1 - Ph - X - alk - R_2$

wherein R_1 is adamantyl, Ph is unsubstituted phenylene, or phenylene substituted by nitro, lower alkyl, lower alkoxy, halogen or trifluoromethyl, X is oxy, alk is alkylene with up to 10 carbon atoms which may be branched in the α-position with respect to R_2 or alkenylene with up to 7 carbon atoms the double bond of which extends from the carbon atoms in α- or β-position to R_2 and which may be branched in the β-position with respect to R_2 and R_2 is carboxyl, lower alkoxycarbonyl, pyridyloxycarbonyl, pyridylcarbonyloxy or pyridylmethoxycarbonyl, or therapeutically acceptable salts thereof.

3,933,836
PYRIDINYLIDENE GUANIDINES

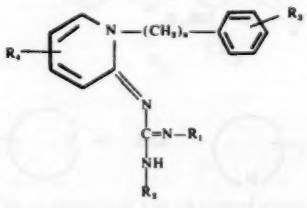
Harry L. Yale, New Brunswick, and James Arthur Bristol, Mercerville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 26, 1974, Ser. No. 509,513

Int. Cl.² C07D 213/06, 213/26

U.S. Cl. 260—296 R **14 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R_1 and R_2 are the same or different and are alkyl, cycloalkyl, aryl or

arylalkyl; R_3 is hydrogen, halogen, trifluoromethyl, alkoxy, aryloxy or dialkylamidosulfonyl; R_4 is hydrogen, halogen, alkyl, alkoxy or aryl; and *n* is 1 or 2; wherein alkyl and alkoxy refer to groups having 1 to 6 carbon atoms; cycloalkyl refers to groups having 3 to 6 carbon atoms; and aryl refers to phenyl or phenyl substituted with 1 or 2 alkyl, alkoxy, halogen or trifluoromethyl groups.

3,933,837

3,4-METHYLENEDIOXYPHENOXY-ALKYL DIKETONES AND KETO-ESTERS

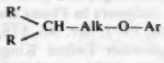
Joseph C. Collins, East Greenbush, and Guy D. Diana, Stephentown, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed July 23, 1973, Ser. No. 381,406

Int. Cl.² C07D 317/06

U.S. Cl. 260—340.5 **10 Claims**

1. A compound of the formula



wherein:

Alk is alkylene of 3 to 10 carbon atoms and having 3 to 7 carbon atoms intervening between the terminal bonds;

R is alkanoyl of 2 to 6 carbon atoms;

R′ is alkanoyl of 2 to 6 carbon atoms or carboalkoxy of 2 to 6 carbon atoms;

and Ar is phenyl substituted by 3,4-methylenedioxy.

3,933,838

5-SUBSTITUTED 2-AMINO-4-ARYLTHIAZOLES

Elso Manghisi, Monza (Milan); Aldo Salimbeni, and Giancarlo Fregnan, both of Milan, all of Italy, assignors to Instituto Luso Farmaco d'Italia S.r.l., Milan, Italy

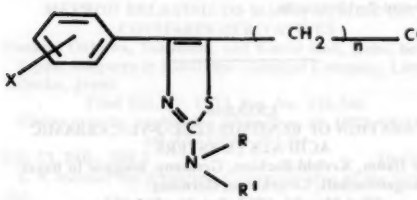
Filed Feb. 23, 1973, Ser. No. 335,255

Claims priority, application Italy, Feb. 25, 1972, 21086/72; Feb. 9, 1973, 20231/73

Int. Cl.² C07D 277/46, 277/42

U.S. Cl. 260—306.8 R **13 Claims**

1. A 5-substituted 2-amino-4-arylthiazole of the formula



in which X represents hydrogen, halogen or methoxy; R is hydrogen or ethyl; R′ is phenyl unsubstituted or substituted with halogen, and when R is hydrogen, R′ can be —CO—R‴, where R‴ is methyl or phenylamino; R″ is hydroxy, ethoxy or 2-diethylaminoethylamino, and *n* is 1, 2 or 3.

3,933,839

THIADIAZOLYLIMIDAZOLINES

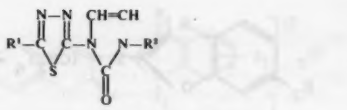
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 11, 1974, Ser. No. 449,817

Int. Cl.² C07D 285/12

U.S. Cl. 260—306.8 D **6 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, lower alkylsulfinyl and cycloalkyl of from 3 to 7 carbon atoms optionally substituted with from 1 to 2 substituents selected from the group consisting of lower alkyl, lower alkoxy, chlorine, bromine and fluorine; and R^2 is lower alkyl.

3,933,840

AZOLE DERIVATIVES

Johann Dahm, Eschollbrucken; Joachim Borck, Darmstadt; Albrecht Wild, Darmstadt, and Jan Willem Hovy, Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

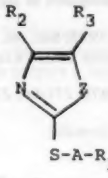
Filed June 6, 1972, Ser. No. 260,307

Claims priority, application Germany, June 11, 1971, 2129012

Int. Cl.² C07D 263/46

U.S. Cl. 260—307 R **19 Claims**

1. An antiphlogistic compound of the formula



wherein R_1 is carboxyl, a physiologically acceptable C_{1-12} alkyl ester thereof, $—CONH_2$ or —CN; R_2 and R_3 each are phenyl or phenyl mono- or di- substituted by at least one member selected from the group consisting of alkyl, alkoxy, alkylmercapto, monoalkylamino, dialkylamino or alkanoylamino wherein the alkyl, alkoxy and alkanoyl each are of up to 4 carbon atoms; F, Cl, Br, I, CF_3, OH, methylenedioxy, NH_2 and NO_2; A is C_nH_{2n} wherein n is an integer from 1 to 10 inclusive; and Z is O or S, and the physiologically acceptable salts thereof.

3,933,841

2-PHENOXY, -PHENYLTHIO-, AND -PHENYL-AMINO-BENZOXAZOLES HAVING AN ISOTHIOCYANO SUBSTITUENT

Paul Brenneisen, Basel; Thomas Wenger, Riehen; Jean-Jacques Gallay, Magden, Aargau, and Wolfgang Schmid, Neuallschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

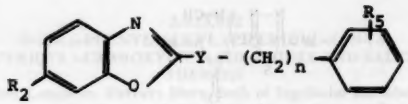
Division of Ser. No. 255,334, May 22, 1972, Pat. No. 3,840,550. This application July 24, 1974, Ser. No. 491,584

Claims priority, application Switzerland, May 24, 1971, 7542/71

Int. Cl.² C07D 263/58

U.S. Cl. 260—307 D **3 Claims**

1. An isothiocyano-benzoxazole compound of the formula



wherein one of R_2 and R_5 is isothiocyano and the other is selected from the group consisting of hydrogen, isothiocyano, methyl, methoxy, chlorine and nitro; Y is oxygen, sulphur or

in which R is hydrogen or methyl; and *n* is 0 or 1.

3,933,842

3-OXADIAZOLYL COUMARINS

Hugh Davidson, Ledston; Keith Trevor Johnson, Carleton; Brian Ernest Leggeter, Sandal, and Anthony John Moore, Leeds, all of England, assignors to Hickson & Welch Limited, England

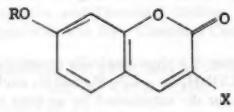
Filed Sept. 5, 1973, Ser. No. 394,494

Claims priority, application United Kingdom, Sept. 6, 1972, 41416/72

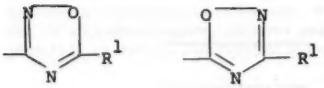
Int. Cl.² C07D *271/06, 271/10*

U.S. Cl. 260—307 G **8 Claims**

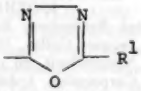
1. A compound of the formula:



wherein R is C_1-C_6 alkyl, C_5-C_7 cycloalkyl or phenyl alkyl in which the alkyl moiety is of 1 to 6 carbon atoms or any of these groups substituted by a non-chromophoric group; and X is a 1,2,4- or 1,3,4-oxadiazolyl group of the formula:



or



wherein R^1 is C_1-C_6 alkyl; C_1-C_6 alkyl substituted by a non-chromophoric group; phenyl or phenyl substituted by a non-chromophoric group; or when said compound possesses a basic nitrogen atom a salt thereof with an acid or a quaternary salt thereof wherein said acid or quaternary salt are non-chromophoric.

3,933,843

CERTAIN 1-SUBSTITUTED-4-OXO-3-SUBSTITUTED PHENYL-1,2,3-TRIAZOLIUM COMPOUNDS

Marwan J. Abu-El-Haj, Groton, and James W. McFarland, Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 395,713, Sept. 10, 1973, which is a continuation-in-part of Ser. No. 170,996, Aug. 11, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,496

Int. Cl.² C07D *249/06, 471/04, 513/04*

U.S. Cl. 260—308 A **2 Claims**

1. 4-oxo-1-t-butyl-3(2,4-dichlorophenyl)-1,2,3-triazole.

3,933,844

BENZOPYRANYLTETRAZOLES

Joachim Augstein, Linford; Hugh Cairns, Loughborough; Dennis Hunter, Loughborough, and John King, Loughborough, all of England, assignors to Fisons Limited, England

Filed Aug. 26, 1971, Ser. No. 175,394

Claims priority, application United Kingdom, Aug. 26, 1970, 41009/70; Jan. 13, 1971, 1642/71; July 1, 1971, 30827/71

Int. Cl.² C07D *405/04, 405/14, 409/04, 409/14*

U.S. Cl. 260—308 D **5 Claims**

1. The compound 5-(4-Oxo-4H-1-thiabenzopyran-2-yl)tetrazole.

3,933,845

BENZOPYRANYLTETRAZOLES

Joachim Augstein, Linford; Hugh Cairns, Loughborough; Dennis Hunter, Loughborough, and John King, Loughborough, all of England, assignors to Fisons Limited, England

Filed Aug. 26, 1971, Ser. No. 175,392

Claims priority, application United Kingdom, Aug. 26, 1970, 41009/70; Jan. 13, 1971, 1642/71; July 1, 1971, 30827/71

Int. Cl.² C07D *405/04, 405/14, 413/14*

U.S. Cl. 260—308 D **3 Claims**

1. The compound 5-[5-(2-Hydroxypropoxy)-4-oxo-4H-1-benzopyran-2-yl]tetrazole.

3,933,846

PREPARATION OF BENZIMIDAZOL-2-YL-CARBAMIC ACID ALKYL ESTERS

Werner Daum, Krefeld-Bockum, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

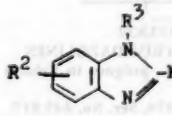
Filed May 24, 1973, Ser. No. 363,673

Claims priority, application Germany, June 8, 1972, 2227919

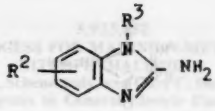
Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **10 Claims**

1. A process for the preparation of a benzimidazol-2-yl-carbamic acid alkyl ester of the formula



consisting essentially of reacting a 2-amino-benzimidazole of the formula



with a compound of the formula

$$R^4-O-R^1 \qquad (III)$$

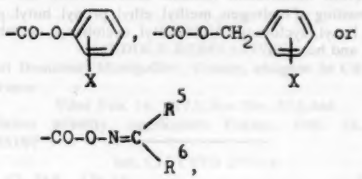
in which

R^1 is alkyl of 1 to 12 carbom atoms optionally substituted by lower alkoxy, lower alkylmercapto, lower alkenyl, lower alkynyl, nitrile, carbamide or halogen,

R^2 is hydrogen, halogen, lower alkyl or lower alkoxy,

R^3 is hydrogen or alkyl of 1 to 8 carbon atoms,

R^4 is



R^5 and R^6 each independently is alkyl or aryl each with up to 10 carbon atoms, and

X is halogen, nitro, or alkyl or alkoxy each of 1 to 3 carbon atoms.

3,933,847

METHOD RELATING TO MANUFACTURE OF COUMARIN DERIVATIVES

Masaaki Ohkawa, Takatsuki, and Koichi Ishii, Kobe, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

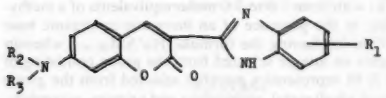
Filed Dec. 19, 1973, Ser. No. 426,346

Claims priority, application Japan, Dec. 25, 1972, 48-2181

Int. Cl.² C07D *405/04*

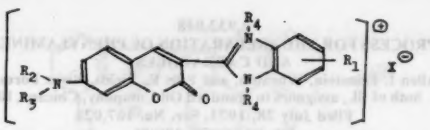
U.S. Cl. 260—309.2 **10 Claims**

1. A method for preparing a coumarin dye of the formula (Ia),

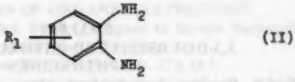


(Ia)

wherein R_1 is a hydrogen or chlorine atom, or a $C_1 - C_2$ alkyl group, R_2 and R_3 are each a hydrogen atom or a $C_1 - C_4$ alkyl group, or a quarternary salt of the dye (Ia) of the formula (Ib),



wherein R_1, R_2 and R_3 are as defined above, R_4 is a C_1–C_2 alkyl or benzyl group and X^- is an anion, which comprises reacting a diamine of the formula (II),

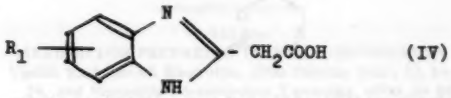


(II)

wherein R_1 is as defined above, with a compound of the formula (III),

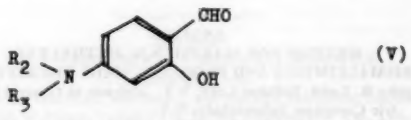
$$X - CH_2 - Y \qquad (III)$$

wherein X and Y may be the same or different, and are each a carboxyl, carbamoyl, alkoxycarbonyl or cyano group, in a 10 to 70% sulfuric acid to prepare a benzimidazolyl acetic acid of the formula (IV),



(IV)

wherein R_1 is as defined above, and then reacting the compound thus obtained with a hydroxybenzaldehyde of the formula (V),



(V)

wherein R_2 and R_3 are as defined above, to obtain the dye of the formula (Ia), or reacting the resulting dye of the formula (Ia) with an alkylating agent to obtain the dye of the formula (Ib).

3,933,848
PROCESS FOR THE PREPARATION OF PHENYLAMINES AND CARBAZOLES

Allen I. Feinstein, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed July 28, 1971, Ser. No. 167,021
Int. Cl.² C07D *209/86*
U.S. Cl. 260—315 **5 Claims**

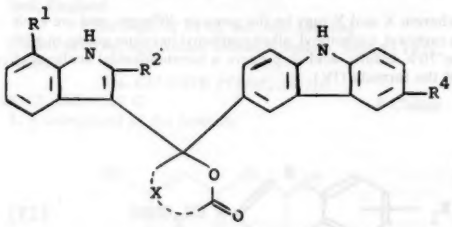
1. A thermal process for the preparation of diphenylamines, phenyl carbazoles, and biphenyls as major products which comprises heating above about 400°C. a compound selected from the group consisting of nitrosobenzene and nitrosobenzene substituted with a material selected from the group consisting of halogen, cyano, aryl, and alkyl groups up to C_8 for a time sufficient to produce diphenylamines, phenyl carbazoles, and biphenyls.

3,933,849
3,3-DISUBSTITUTED PHTHALIDES AND NAPHTHALIDES

Paul S. Huyffer, West Boxford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 202,555, Nov. 26, 1971, Pat. No. 3,816,120. This application Apr. 26, 1974, Ser. No. 464,995
Int. Cl.² C07D *209/86*
U.S. Cl. 260—315 **19 Claims**

1. An indicator dye of the formula:



wherein one of R^1 and R^2 is hydrogen and the other is a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —NH— and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, sulfonamido and sulfamoyl; R^4 is hydrogen or alkyl containing 1 to 20 carbon atoms; and X represents the carbon atoms necessary to complete a ring-closing moiety selected from phthalide and naphthalide.

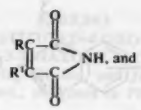
3,933,850
METHOD FOR MAKING N,N'-METHYLENE BISMALEIMIDES AND PRODUCTS MADE THEREFROM

John R. Ladd, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

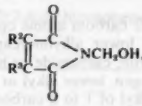
Division of Ser. No. 246,287, April 21, 1972, Pat. No. 3,833,609. This application May 28, 1974, Ser. No. 473,429
Int. Cl.² C07D *207/44*
U.S. Cl. 260—326.26 **3 Claims**

1. A method which comprises, (1) saturating with boron trifluoride at temperature of from 0°C to 60°C a maleimide mixture selected from

a. a mixture of formaldehyde, an organic solvent and about two moles, per mole of formaldehyde of a maleimide of the formula,



b. A mixture of substantially equal moles of said maleimide of (a) and an N-methanolmaleimide of the formula,



in the presence of an organic solvent, and

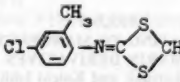
2. recovering an N,N'-methylene bismaleimide from the mixture of (1), where R, R^1, R^2 and R^3 are the same or different monovalent radicals selected from the class consisting of hydrogen, methyl, ethyl, propyl, butyl, pentyl, hexyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, and halogen.

3,933,851
PREPARATION OF AROMATIC 2-IMINO-1,3-DITHIETANES

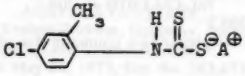
David William Reger, and Matthew Michael Nigro, both of Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 6, 1974, Ser. No. 440,112
Int. Cl.² C07D *339/00*
U.S. Cl. 260—327 M **13 Claims**

1. A method for preparing a compound of the formula:



which comprises the steps of: reacting at a temperature ranging from 0°C. to 35°C. 1 mole of (a) a compound of the formula:



wherein A^+ represents a member selected from the group consisting of a tertiary alkyl (C_1–C_4)-substituted ammonium ion and (b) with from 1.0 to 3.0 molar equivalents of a methylene halide, in the presence of an inorganic or organic base and a sulfide ion having the formula: $Ha'SM_{(2-a')}$, wherein a' represents an integer selected from the group consisting of 0, 1 and 2; M represents a member selected from the group consisting of alkali metal, ammonium and primary, secondary, and a tertiary alkyl (C_1–C_4)-substituted quaternary ammonium ion; in a (C_3–C_6) ketonic solvent selected from the group consisting of acetone, methyl ethyl ketone, methyl propyl ketone, methyl isopropyl ketone, methyl n-butyl ketone, methyl isobutyl ketone, cyclohexanone and mixtures of water and said (C_3–C_6) ketonic solvent, and recovering the desired product.

3,933,852
PROCESS FOR MAKING N-METHYL NITROPHTHALIMIDES

Newell C. Cook, Schenectady, and Gary C. Davis, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1974, Ser. No. 468,012
Int. Cl.² C07D 209/34
U.S. Cl. 260—326 N 7 Claims

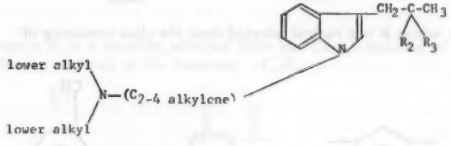
1. In the process for isolating a mixture of N-methyl-3-nitrophthalimide and N-methyl-4-nitrophthalimide from a solution of the latter in concentrated sulfuric acid, the improvement which comprises extracting the aforesaid two nitrophthalimides with methylene chloride as the extractant.

3,933,853
INDOLE DERIVATIVES

Henri Demarne, Montpellier, France, assignor to Clin Midy, France

Filed Feb. 16, 1973, Ser. No. 333,344
Claims priority, application France, Feb. 16, 1972, 72.05197
Int. Cl.² C07D 209/14
U.S. Cl. 260—326.15 4 Claims

1. A 1, 3-disubstituted indole of the formula



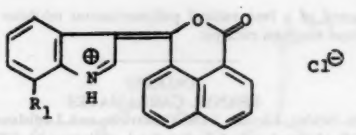
wherein R_2 is H and R_3 is OH.

3,933,854
3-(INDOL-3-YL)DEHYDRONAPHTHALIDE HYDROCHLORIDES

Yunn H. Chiang, Woburn, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 3, 1973, Ser. No. 420,931
Int. Cl.² C07D 209/18, 209/20
U.S. Cl. 260—326.13 R 4 Claims

1. A compound of the formula:



wherein R_1 is hydrogen or a group selected from o-hydroxyphenyl, bis-trifluoromethylcarbinol, nitro, cyano and —COX wherein X is —OR′ or —NR″R‴ and each of said R′, R″ and R‴ is hydrogen or a hydrocarbon group slected from alkyl containing 1 to 20 carbon atoms, phenyl, naphthyl, phenyl-substituted alkyl containing up to 20 carbon atoms and alkyl-substituted phenyl containing up to 20 carbon atoms.

3,933,855
PRODUCTION OF ORGANIC SULPHOXIDES

Bernard Tramier, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed June 29, 1973, Ser. No. 375,163
Claims priority, application France, June 30, 1972, 72.23668
Int. Cl.² C07D 333/48
U.S. Cl. 260—329 R 9 Claims

1. In a process for producing an organic sulphoxide by reacting the corresponding sulphide with an organic sulphoxide having a lower molecular weight than the desired sulphoxide in the presence of a catalyst at elevated temperature equal to or below the boiling point of the reaction mixture, the improvement which comprises employing 1–3 percent by volume based on the volume of said lower molecular weight sulphoxide of an aqueous acidic solution of a strong electrolyte as the catalyst wherein said aqueous solution contains 0.1–10 mols per liter of a strong acidic electrolyte selected from the group consisting of perchloric acid, hydrochloric acid, hydrofluoric acid, hydriodic acid, nitric acid, and the ammonium salts thereof.

3,933,856
METHOD FOR PREPARING TETRAHYDROTHIOPHEN

Vazikh Kashapovich Khairullin, ulitsa Sibirsky trakt, 22, kv. 24, and Margarita Alexandrovna Vasyanina, ulitsa 50 let Oktyabrya, 18, kv. 7, both of Kazan, U.S.S.R.

Filed Nov. 8, 1973, Ser. No. 413,950
Int. Cl.² C07D 333/10
U.S. Cl. 260—332.8 4 Claims

1. A method for preparing tetrahydrothiophen comprising reacting tetrahydrofuran with a sulphidation agent selected from the group consisting of elementary sulphur and sulphides of phosphorus taken in a stoichiometric ratio of the said substances, at a temperature of from 175° to 215°C, and separating said tetrahydrothiophen from the reaction mixture by distillation at 116°–122°C at atmospheric pressure.

3,933,857
POLYMERIZABLE CYCLOACETAL RESINOUS COMPOSITION

Toshiaki Hanyuda, Yokohama, and Eiichiro Takiyama, Tokyo, both of Japan, assignors to Showa Highpolymer Co., Ltd., Japan

Filed Oct. 18, 1973, Ser. No. 407,626
Int. Cl.² C07D 317/04; C08F 24/00
U.S. Cl. 260—340.7 2 Claims

1. A polymerizable cycloacetal composition, prepared by reacting 1 equivalent of (I) diallylidenepentaerythritol with 0.8–2.0 equivalents of (II) polyhydric alcohol-unsaturated monocarboxylic acid ester having one alcoholic hydroxyl group and at least one substituent selected from methacrylyl, acrylyl and crotonyl groups, with or without a solvent, in the

presence of a free radical polymerization inhibitor and an addition reaction catalyst.

3,933,858

PHENYL CARBAMATES

Erwin Nikles, Liestal; Volker Dittrich, and Ladislaus Pinter, both of Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 402,650, Oct. 1, 1973, Pat. No. 3,856,816, which is a division of Ser. No. 197,474, Nov. 10, 1971, Pat. No. 3,781,301, which is a continuation of Ser. No. 2,445, Jan. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 782,335, May 13, 1968, abandoned, which is a division of Ser. No. 493,256, Oct. 5, 1965, abandoned. This application Oct. 10, 1974, Ser. No. 513,607

Claims priority, application Switzerland, Oct. 8, 1964, 13113/64

Int. Cl.² C07D *319/06*

U.S. Cl. 260—340.7 **1 Claim**

1. ortho-(1,3-Dioxan-2-yl)-phenyl-N-methylcarbamate.

3,933,859

DIHYDROCOUMARIN DERIVATIVES

Ado Kaiser, Neu-Frenkendorf; Wolfgang Koch, Riehen; Marcel Scheer, Basel, and Uwe Wolcke, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Division of Ser. No. 191,358, Oct. 21, 1971, abandoned. This application June 12, 1974, Ser. No. 478,654

Claims priority, application Switzerland, Oct. 30, 1970, 16041/70

Int. Cl.² C07D *311/20*

U.S. Cl. 260—343.2 R **4 Claims**

1. L-3-formamido-6,7-dihydroxyhydrocoumarin.

3,933,860

3-(N-ACYL-N-ARYLAMINO) LACTONES

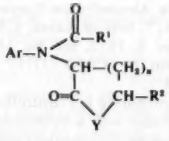
David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 10, 1975, Ser. No. 548,660

Int. Cl.² C07D *309/30*

U.S. Cl. 260—343.5 **8 Claims**

1. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R^1 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 3 carbon atoms and 1 to 5 of the same or different halogen selected from fluoro, chloro or bromo, phenyl, or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R^2 is hydrogen or alkyl of 1 to 6 carbon atoms; Y is 0 and n is 1 or 2.

3,933,861

PRODUCTION OF TETRAHYDROFURANS

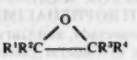
Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 7, 1974, Ser. No. 431,258

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.1 **11 Claims**

1. A process for producing tetrahydrofurans which comprises codimerizing in the gaseous or liquid phase an alkene oxide of 2 to 6 carbon atoms of the formula



with an alkene of 2 to 6 carbon atoms of the formula $R^5R^6C{=}CR^7R^8$ wherein R^1, R^2, R^3, R_4, R^5, R^6, R^7, and R^8 represent hydrogen or an alkyl group of 1 to 4 carbon atoms, in the presence of catalytic amounts of a Group VIII noble transition metal compound of the formula $M(L)_n(X)_m$, wherein M represents Ru, Rh, Pd, Os, Ir or Pt; n is 0 to 5 inclusive; m is 0 to 3 inclusive; $n + m$ is 3 to 6 inclusive; L represents non-ionic organic ligands complexed to M selected from the group consisting of water, carbon monoxide, olefin and hydrocarbyl phosphine, arsine, stibine, and bismuthine; and X represents inorganic ions bonded to M selected from the group consisting of halide, hydride and nitrite, and an iodide promoter selected from the group consisting of iodine, hydrogen iodide, alkyl iodide and iodohydrin, at a temperature from 100°C to 250°C.

3,933,862

AROMATIC DITHIO DIANHYDRIDES

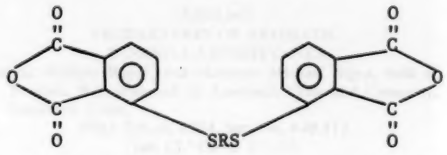
Frank J. Williams, III, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,136

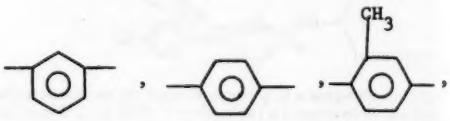
Int. Cl.² C07D *307/89*

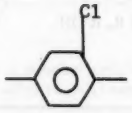
U.S. Cl. 260—346.3 **5 Claims**

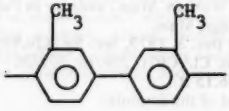
1. A dithioanhydride having the formula

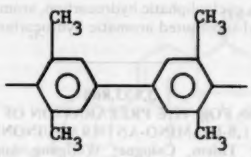


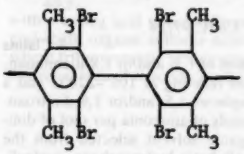
where R is a radical selected from the class consisting of



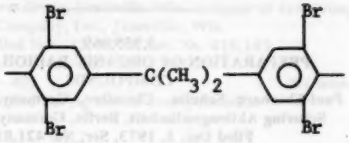




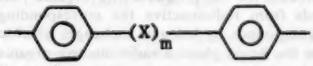




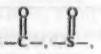
and



and divalent organic radicals of the general formula



where X is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,



—O—, and —S—, where *m* is 0 or 1, y is a whole number from 1 to 5.

3,933,863

3-FURYL CHALCOGEN ALKYL SULFIDES

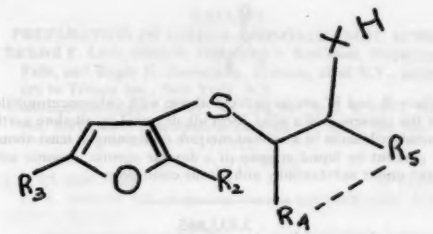
William J. Evers, Middletown; Igor A. Pelse, Long Branch, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 21, 1975, Ser. No. 542,830

Int. Cl.² C07D *307/64*

U.S. Cl. 260—347.2 **7 Claims**

1. A 3-furyl beta-chalcogenalkyl sulfide having the structure:



wherein X is a chalcogen selected from the group consisting of oxygen and sulfur; R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 or R_3 being methyl and hydrogen, at least one of R_2 or R_3 being methyl; and R_4 and R_5, taken separately, are each methyl.

3,933,864

PROCESS FOR PREPARING GLYCIDONITRILES

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 10, 1974, Ser. No. 531,431

Int. Cl.² C07D *303/46*

U.S. Cl. 260—348 R **8 Claims**

1. A process for preparing a glycidonitrile of the formula

wherein R is aromatic and

R' is an aliphatic group,

which comprises reacting a ketone or aldehyde of the formula

where R and R′ are as defined above with chloroacetonitrile in the presence of a solid form alkali metal or alkaline earth metal hydroxide in a solvent mixture containing at least about 3 percent by liquid volume of a dipolar aprotic, organic solvent under substantially anhydrous conditions.

3,933,865

ARTHROPOD MATURATION INHIBITORS

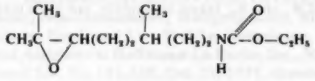
Meyer Schwarz, Kensington; Philip E. Sonnet, Bowie, and Nobel Wakabayashi, New Carrollton, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 348,843, April 6, 1973, which is a division of Ser. No. 104,781, Jan. 7, 1971, Pat. No. 3,824,319. This application Jan. 15, 1975, Ser. No. 541,317

Int. Cl.² C07D *303/46*

U.S. Cl. 260—348 A **1 Claim**

1. A Compound of the formula



3,933,866

PROCESS FOR THE MANUFACTURE OF AMINO-ANTHRAQUINONES

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

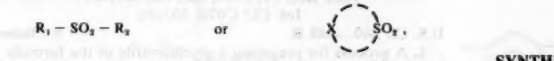
Filed Sept. 26, 1973, Ser. No. 400,759

Claims priority, application Switzerland, Oct. 5, 1972, 14562/72

Int. Cl.² C07C *87/64*

U.S. Cl. 260—382 **5 Claims**

1. A process for the manufacture of 1-aminoanthraquinone which may be substituted with halogen or lower alkyl from corresponding nitroanthraquinone, wherein the nitroanthraquinone is reacted with ammonia in dipolar aprotic solvents that are inert towards ammonia and nitroanthraquinones and having a dielectric constant of at least 30 and of the formula



wherein R_1 and R_2 each are straight or branched alkyl with 1 to 4 carbon atoms or phenyl or phenyl substituted with lower alkyl, halogen or nitro, X is a straight or branched hydrocarbon chain with 4 to 10 carbon atoms which may be substituted with halogen or acetoxy, in a temperature range between 20°C and 250°C.

3,933,867

PROCESS FOR THE PREPARATION OF 1-AMINOANTHRAQUINONE

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal, and Rutger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Mar. 22, 1974, Ser. No. 453,971

Claims priority, application Germany, Mar. 22, 1973, 2314218

Int. Cl.² C07C *97/24*

U.S. Cl. 260—382 **6 Claims**

1. Process for the preparation of 1-aminoanthraquinone comprising reacting at 100°–220°C and superatmospheric pressure 1-nitroanthraquinone with ammonia in a molar ratio of ammonia: 1-nitroanthraquinone of at least 2:1 in at least one organic solvent selected from the group consisting of aliphatic ether, cycloaliphatic ether, aromatic ether, aliphatic hydrocarbon, cycloaliphatic hydrocarbon, aromatic hydrocarbon and alkyl-substituted aromatic hydrocarbon.

3,933,868

PROCESS FOR THE PREPARATION OF 1,5- AND 1,8-DIAMINO-ANTHRAQUINONE

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal; Rutger Neeff, Leverkusen, and Heinz Scheiter, Leverkusen-Steinbuechel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Mar. 22, 1974, Ser. No. 453,810

Claims priority, application Germany, June 14, 1973, 2330230

Int. Cl.² C07C *97/24*

U.S. Cl. 260—382 **4 Claims**

1. Process for the preparation of 1,5- and/or 1,8-diaminoanthraquinone which comprises reacting at 100°–220°C and a pressure of at least 20 atmospheres 1,5- and/or 1,8-dinitroanthraquinone with at least 4 mols of ammonia per mol of dinitroanthraquinone in an organic solvent selected from the group consisting of ethers, aliphatic hydrocarbons, cycloaliphatic hydrocarbons, aromatic hydrocarbons, alkyl-substituted aromatic hydrocarbons, and mixtures thereof.

3,933,869

PREPARATION OF ORGANIC RADIOHALOGEN COMPOUNDS

Paul-Eberhard Schulze, Chemiker, Germany, assignor to Schering Aktiengesellschaft, Berlin, Germany

Filed Dec. 5, 1973, Ser. No. 421,818

Claims priority, application Germany, Dec. 8, 1972, 2260933

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.4 **31 Claims**

1. A process for the production of organic radiohalogen compounds from radioinactive the corresponding organic halogen compounds by halogen exchange, which comprises heating in the liquid phase a radio-inactive organic halogen compound under non-aqueous conditions with an alkali metal halogenide or alkaline earth halogenide wherein the halogenide is fluorine-18, chlorine-38, bromine-82 or iodine-123, -125, -131 or -132.

3,933,870

SYNTHESIS OF A-RING AROMATIC STEROIDS

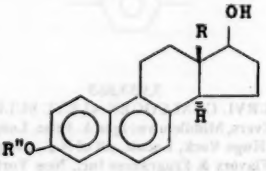
Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 375,558, July 2, 1973, which is a continuation-in-part of Ser. No. 295,032, Oct. 4, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,262

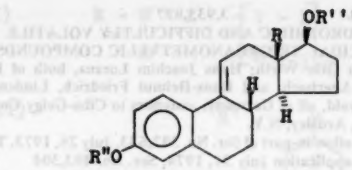
Int. Cl.² C07J *9/00, 1/00*

U.S. Cl. 260—397.5 **4 Claims**

1. A process for the preparation of a compound of the formula



wherein R is lower alkyl and R″ is lower alkyl, tertiary lower alkyl, benzyl, diphenylmethyl, or trityl, which comprises contacting a compound of the formula



wherein R and R'' are as above and R'''is tertiary lower alkyl,

with a strong acid selected from the group consisting of mineral acids, organic sulfonic acids and trifluoroacetic acid and, where trifluoroacetic acid is employed, hydrolyzing the 17-trifluoroacetate of reaction product with aqueous base.

3,933,871

FABRIC SOFTENER COMPOUND AND PROCESSES FOR PREPARING AND USING THE SAME

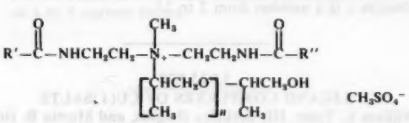
Leonard J. Armstrong, Janesville, Wis., assignor to Armstrong Chemical Company, Inc., Janesville, Wis.

Filed Nov. 12, 1973, Ser. No. 415,143

Int. Cl.² C07C *103/38*

U.S. Cl. 260—401 **5 Claims**

1. A compound having the following formula:



wherein R' and R'' are alkyl or alkylene radicals having from 10 to 20 carbons in their carbon chains and $n + 0$ to 4.

3,933,872

METHOD FOR PREPARING FATTY HYDROXAMATES

James A. Hartlage, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 10,589, Feb. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 569,850, Aug. 3, 1966, abandoned. This application Apr. 20, 1973, Ser. No. 353,166

Int. Cl.² C07C *83/08, 91/26*

U.S. Cl. 260—404 **7 Claims**

1. A process for the preparation of an alkali metal salt of a fatty hydroxamic acid which comprises the steps:

1. reacting an anhydrous slurry of hydroxylamine sulfate and a lower alkanol solution of a lower alkyl ester of a C_6–C_{26} fatty acid with dimethylamine to provide an alcoholic solution of the corresponding fatty hydroxamic acid;
2. neutralizing the fatty hydroxamic acid of step (1) with a lower alkanol solution of an alkali metal hydroxide or lower alkoxide; and
3. recovering the resultant fatty hydroxamate.

5. A process for the preparation of ammonium fatty hydroxamates which comprises the steps:

1. reacting an agitated anhydrous slurry of hydroxylamine sulfate and a lower alkanol solution of a lower alkyl ester of a C_6–C_{26} fatty acid with dimethylamine to provide an alcoholic solution of the ammonium salt of the corresponding fatty hydroxamic acid; and
2. recovering the resultant ammonium fatty hydroxamate.

3,933,873

PREPARATION OF OMEGA-AMINOALKANOIC ACIDS

Richard F. Love, Fishkill; Mahmoud S. Kablaoui, Wappinger Falls, and Roger G. Duranleau, Ardonia, all of N.Y., assignors to Texaco Inc., New York, N.Y.

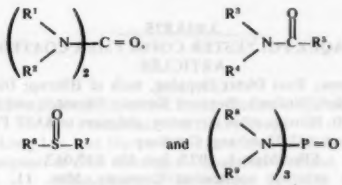
Continuation-in-part of Ser. No. 206,197, Dec. 8, 1971, Pat. No. 3,816,404. This application June 10, 1974, Ser. No. 477,712

Int. Cl.² C07C *99/00*

U.S. Cl. 260—404 **27 Claims**

1. A method for preparing omega-aminoalkanoic acids which conprises:

a. simultaneously contacting at a temperature between about 0° to 40°C. a solution containing a C_7 to C_{20} cycloalkene, a denitrating agent and an aprotic organic solvent with dinitrogen tetroxide and oxygen, wherein said denitrating agent is selected from the group consisting of 2-pyrrolidinones,



where R^1, R^2, R^6, R^7, R^8 and R^9 are alkyl of from 1 to 5 carbons and R^3, R^4 and R^5 are hydrogen or alkyl of from 1 to 5 carbons, where the mole ratio of cycloalkene to denitrating agent is above about 0.5:1 to about 2:1, thereby forming 2-nitrocycloalkanone,

b. contacting 2-nitrocycloalkanone with an alcohol, wherein said alcohol is a primary or secondary alcohol corresponding to the formula R'OH where R' is an alkyl group of from 1 to 20 carbon atoms, in a non-aqueous environment at a temperature of from about 20° to 200°C. thereby forming an alkyl omega-nitroalkanoate,

c. contacting said alkyl omega-nitroalkanoate with hydrogen and a Group VIII metal catalyst at a temperature of from 20° to 300°C. under a hydrogen pressure of 500 to 1500 p.s.i.g. thereby forming an alkyl omega-aminoalkanoate, and

d. contacting said alkyl omega-aminoalkanoate with water at a temperature of from 150° to 300°C.

3,933,874

METHOD FOR PREPARING OF β-ANILINO-β-HYDRAZINOACRYLATES

Atsuaki Arai, Minami-ashigara; Daijiro Nishio, Odawara; Mitsugu Tanaka, Minami-ashigara; Yoshikazu Fujita, and Hisao Suzuki, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

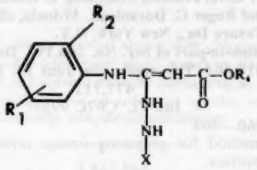
Filed Dec. 13, 1974, Ser. No. 532,577

Claims priority, application Japan, Dec. 13, 1973, 48-140963

Int. Cl.² C09F *7/00*; **C07C** *149/40, 79/46*

U.S. Cl. 260—404.5 **7 Claims**

1. A β-anilino-β-hydrazinoacrylate represented by the following general formula (I)



(I)

wherein R_1 represents an acylamino group, an alkylsulfamoyl group, an arylsulfamoyl group or an alkoxycarbonyl group; R_2 represents a halogen atom, an alkyl group or an alkoxy group; R_4 represents an alkyl group; and X represents an aryl group.

3,933,875
OPAQUE POLYESTER COPOLYMER COATED ARTICLES

Horst Brose; Karl Dieter Depping, both of Hiltrup; Dietrich Hentschel, Wolbeck; Bernard Kostevc, Munster, and Klaus Schmidt, Hiltrup, all of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Germany

Filed Mar. 1, 1973, Ser. No. 337,063

Claims priority, application Germany, Mar. 11, 1972, 2211899; Apr. 1, 1972, 2216052; Apr. 22, 1972, 2219847

Int. Cl.² B32B 27/38, 27/00

U.S. Cl. 428—413 **5 Claims**

1. In a process for the production of opaque coated articles comprising applying and conventionally curing on the surface of said articles normally transparent coating compositions containing unsaturated polyesters (I), copolymerizable monomers (II), catalysts and additives, the improvement comprising: said coating composition containing said unsaturated polyester (I) and said copolymerizable monomers (II) in a relationship of about 3 –45 weight percent (I) and about 55 – 97 weight percent (II), and additionally 0.1 to 15 weight percent related to the content of unsaturated polyesters of synthetic resins selected from the group consisting of nitrocellulose, cellulose-acetobutyrate, alkyd resins, ketone resins, saturated polyester resins, poly-adipates, epoxide resins, polyurethane resins, amine-aldehyde resins, phenolic resins, acrylic resins, methacrylic resins, vinylchloride polymers, vinylacetate polymers and vinylpropionate polymers.

3,933,876
HYDRIDE COMPLEXES OF METALS OF GROUPS IVB AND VB

Frederick Nye Tebbe, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 191,902, Oct. 22, 1971, abandoned. This application July 2, 1974, Ser. No. 485,317

Int. Cl.² C07F 7/00, 7/28

U.S. Cl. 260—429 R **22 Claims**

1. Hydrides of the formula

$(PR_3)_z(R_4'PR''PR_2')_yMH_x$,

wherein:

M is Nb, Ta, Ti, Zr, or Hf

R is alkyl, aryl, alkaryl or aralkyl of up to 8 carbon atoms

R′ is alkyl, aryl, alkaryl or aralkyl of up to 8 carbon atoms

R″ is alkylene of up to 3 carbon atoms, or o-phenylene

with the provisos that: when

M is Nb or Ta,

$x = 0, 1, 2$ or 4; $y = 0, 2$ or 3; $z = 1, 3$ or 5; and $2x + 4y + z = 13$; and

when,

M is Ti, Zr of Hf,

$x = 0$, $y = 1$, and $z = 3$.

3,933,877
HYDROPHILIC AND DIFFICULTLY VOLATILE BIOCIDAL TRIORGANOMETALLIC COMPOUNDS

Hermann Otto Wirth; Hans Joachim Lorenz, both of Bensheim-Auerbach, and Hans-Helmut Friedrich, Lindenfels, Odenwald, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

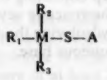
Continuation-in-part of Ser. No. 382,633, July 25, 1973. This application July 31, 1974, Ser. No. 493,304

Claims priority, application Germany, Aug. 4, 1972, 2238360; July 6, 1973, 2334383

Int. Cl.² C07F 7/22

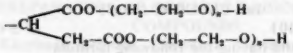
U.S. Cl. 260—429.7 **8 Claims**

1. A triorganometallic compound of the general formula I



(I)

wherein M represents tin or lead and R_1, R_2, and R_3 each independently represents a linear or branched aliphatic group with 1 to 16 carbon atoms, which can be saturated or singly olefinically unsaturated, the cyclopentyl-, cyclohexyl-, or phenyl group, the sum of the carbon atoms of the substituents R_1, R_2, and R_3 being at most 18 and wherein A represents a strongly hydrophilic group of the formula II



(II)

wherein n is a number from 2 to 15.

3,933,878
LIGAND COMPLEXES OF CU(1)SALTS

William E. Tyler, III, Berkeley Heights, and Martin B. Dines, Mountainside, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 259,079, June 2, 1972, Pat. No. 3,776,972. This application Aug. 10, 1973, Ser. No. 387,445

Int. Cl.² C07F 1/08

U.S. Cl. 260—438.1 **5 Claims**

2. Compositions of matter having the general formula $CuAlCl_4.L$ wherein L is a phosphine having the formula $R_1R_2R_3P$, wherein R_1, R_2 and R_3 are independently selected from the group consisting of alkyl radicals having from 1–30 carbon atoms and which form 1:1 liquid adducts with $CuAlCl_4$ moiety under ambient conditions.

3,933,879
CHELATED LITHIUM ALUMINUM COMPOUNDS

Arthur W. Langer, Jr., Watchung, and Thomas A. Whitney, Roselle, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 808,328, March 18, 1969, Pat. No. 3,734,963. This application Mar. 23, 1973, Ser. No. 344,230. The portion of the term of this patent subsequent to May 22, 1990, has been disclaimed.

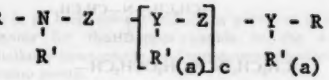
Int. Cl.² C07F 5/06

U.S. Cl. 260—448 R **8 Claims**

1. A complex comprising: (a) a lithium hydrido aluminate having a lattice energy less than 210 kilocalories per mole at 18°C and (b) a monomeric or polymeric polyfunctional chelating tertiary hydrocarbyl amine containing at least 2 nitrogen atoms.

2. A complex according to claim 1 wherein the amines are chelating polyfunctional Lewis bases, said bases being ones selected from the group consisting of tris-(2-C_1-C_4 dialkylaminoethyl)-amine and those compounds having the formulas:

(I)



(II)

wherein *c* is an integer of 0 to 10,000 inclusive: Y is one selected from the group consisting of N and O; *a* is an integer equal to 0 or 1 depending on whether Y is N or O; R is the same of different C_1-C_4 alkyl radical; R' is the same or different C_1-C_4 alkyl radical or C_6-C_{10} aryl or aralkyl radical; and Z is a nonreactive radical selected from the group consisting of:

1. C_4-C_{10} cycloaliphatic or aromatic radicals and their lower alkyl derivatives wherein said radicals are attached to the N atoms in Formula I at 1,2 positions on the aromatic rings or 1,2 or 1,3 positions on the cycloaliphatic rings; and
2. 1 to 4 methylenic radicals, wherein each methylenic radical contains 0 to 2 monovalent hydrocarbon radicals of 1 to 6 carbon atoms.

3,933,880

METHOD OF PREPARING A PLATINUM CATALYST INHIBITOR

Floyd A. Bergstrom; Chi-Long Lee, and Myron T. Maxson, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1974, Ser. No. 528,961

Int. Cl.² C07F 7/02, 7/08, 7/18

U.S. Cl. 260—448.2 E **7 Claims**

1. A method of reacting an acetylenic alcohol with a siloxane compound having at least three silicon-bonded-hydrogen atoms bonded to at least three different silicon atoms in the presence of a platinum catalyst to provide an olefinic siloxane compound wherein the olefinic siloxane compound is an inhibitor for the platinum catalyst

comprising continuously passing a liquid mixture of the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms in the presence of a platinum catalyst through a heating means wherein the liquid mixture is heated to a temperature which is above 100°C. and which is also above the temperature at which the olefinic siloxane compound is no longer an inhibitor for the reaction, but the temperature and residence time of the liquid mixture in the heating means being sufficient to produce the olefinic siloxane compound without substantial decomposition of reactants and product, said liquid mixture is under sufficient pressure to maintain the reactants and product in a liquid state at least until the mixture has passed through the heating means, said product being an olefinic siloxane compound which is, below 100°C., an inhibitor for the reaction between the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms in the presence of a platinum catalyst.

3,933,881

PROCESS FOR THE MANUFACTURE OF β-CHLOROETHYL-METHYL-DICHLOROSILANE

Werner Föry, Basel, and Hermann Kny, Fullinsdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,143

Claims priority, application Switzerland, Dec. 15, 1973, 17556/73

Int. Cl.² C07F 7/12

U.S. Cl. 260—448.2 E **5 Claims**

1. A process for the manufacture of β-chloroethyl-methyl-dichlorosilane by addition of HC1 to methylvinyl-dichlorosilane in the presence of $A1C1_3$ and distilling off the resultant end product from the reaction mixture, wherein the isolation of the β-chloroethyl-methyl-dichlorosilane by distillation is effected in the presence of at least 1 mole of alkali metal chloride or of ammonium chloride, relative to $A1C1_3$, at a bath temperature above 30°C in vacuo.

3,933,882

TUBE METHOD FOR THE PREPARATION OF OLEFINIC SILOXANE COMPOUNDS

Chi-Long Lee, and Myron T. Maxson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1974, Ser. No. 528,960

Int. Cl.² C07F 7/02, 7/08, 7/18

U.S. Cl. 260—448.2 E **14 Claims**

1. A method of reacting an acetylenic alcohol with a siloxane compond having at least three silicon-bonded hydrogen atoms bonded to at least three different silicon atoms in the presence of a platinum catalyst to provide an olefinic siloxane compound wherein the olefinic siloxane compound is an inhibitor for the platinum catalyst

comprising passing a vaporized mixture of acetylenic alcohol, a soluble platinum catalyst and siloxane compound having at least three silicon-bonded hydrogen atoms through a tube heated at a temperature of from 210°C. to 450°C. and collecting a reaction product which is an olefinic siloxane compound which is, below 100°C., an inhibitor for the reaction between the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms in the presence of a platinum catalyst, said mixture containing from 0.01 to 2 parts by weight platinum per one million parts by weight mixture.

3,933,883

METHANATION CATALYST AND PROCESS OF USE

R. Parthasarathy, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,630

Int. Cl.² C07C 1/04

U.S. Cl. 260—449 M **5 Claims**

1. A method for converting a feed gas stream containing principally carbon monoxide, hydrogen and methane to a product gas stream containing essentially completely methane, comprising passing said feed gas stream in fluidized contact with a catalyst consisting of an alumina support having a purity of more than 99 percent by weight alumina, of which at least 70 percent by weight is present as gamma alumina and impregnated with nickel and cobalt in a nickel to cobalt atomic ratio of 1 to 1.5 and containing about 3 to 10 percent by weight metal values, said catalyst having a surface area of about 100 to 200 m^2/g, pores in a pore diameter range of 35 to 200A, with an average pore diameter of 100 to 115A and a pore volume of 0.25 to 0.7 cc/g; at a pressure of 100 to 2,000 psig and at a temperature of 120° to 650°C.

3,933,884

PROCESS FOR PREPARING THIOL ESTERS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,190
Int. Cl.² C07C *153/09*
U.S. Cl. 260—455 R 7 Claims

1. A process for converting unsaturated aliphatic 1-alkenes containing 2 to 30 carbon atoms to linear saturated aliphatic thiol esters of carboxylic acids in good yield and relatively uncontaminated with non-linear thiol esters and by-products, by a process of:

a. admixing each mole of 1-alkene to be converted to said thiol ester, with at least a catalytic amount of a palladium catalyst selected from the group consisting of:
$PdCl_2[P(C_6H_5)_3]_2—SnCl_2$
$PdCl_2[P(p\text{-}CH_3O.C_6H_4)_3]_2—SnCl_2$
$PdCl_2[P(CH_3)_2C_6H_5]_2—SnCl_2$
$PdCl_2[P(C_6H_5)_3]_2—GeCl_2$
$PdCl_2[As(C_6H_5)_3]_2—SnCl_2$ and
$PdCl_2[P(C_6H_5)_3]_2—SnCl_4$
in the presence of at least a molar equivalent of mercaptan coreactant selected from the group consisting of saturated aliphatic mercaptans containing 1 to 10 carbon atoms, and

b. pressurizing said reaction mixture with sufficient carbon monoxide to satisfy the stoichiometry of the carbonylation reaction;

c. heating said pressurized reaction mixture to between 20° and 120°C, until conversion of the aliphatic 1-alkene substrate to said linear saturated aliphatic esters of carboxylic acids takes place, and

d. isolating said saturated thiol ester contained therein.

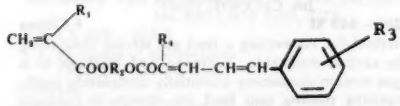
3,933,885

CINNAMYLIDENEACETIC ACID ESTERS

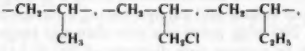
Masato Satomura, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 12, 1974, Ser. No. 441,782
Claims priority, application Japan, Feb. 13, 1973, 48-17716
Int. Cl.² C07C *69/76*, *121/70*
U.S. Cl. 260—465 D 2 Claims

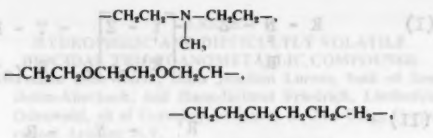
1. A monomer represented by the following formula



wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents —CH_2CH_2—, —$CH_2CH_2CH_2$—, —$CH_2CH_2CH_2CH_2$—,



—$CH_2CH_2OCH_2CH_2$—,



—$CH_2CH_2SCH_2CH_2$—, —C_6H_{10}—, —C_6H_4—, —$CH_2C_6H_4CH_2$—, or —$CH_2C_6H_{10}CH_2$—; R_3 is a hydrogen atom, a halogen atom, a methoxy group, a nitro group or a methyl group; R_4 is a hydrogen atom, a cyano group or a carbamoyl group.

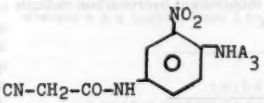
3,933,886

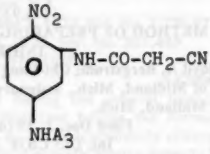
DIAMINO-NITRO-BENZENE COMPOUNDS

Ferdi Saygin, Dusseldorf, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany

Continuation of Ser. No. 272,383, July 17, 1972, abandoned. This application May 16, 1974, Ser. No. 470,385
Claims priority, application Germany, Oct. 4, 1971, 2149467; Feb. 18, 1972, 2207683
Int. Cl.² C07C *121/78*
U.S. Cl. 260—465 D 3 Claims

1. A compound of the formulae selected from the group consisting of





wherein A_3 is a member selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, alkanoyl of 2 to 10 carbon atoms, cyano alkanoyl of 2 to 10 carbon atoms in the alkanoyl and acyl of aromatic hydrocarbon carboxylic acids having 7 to 15 carbon atoms.

3,933,887

PROCESS FOR PREPARING 4-AMINO-2,5-DIALKOXYBENZONITRILES

Kurt Gengnagel, Offenbach (Main), Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 22, 1974, Ser. No. 490,414
Claims priority, application Germany, July 26, 1973, 2337951
Int. Cl.² C07C *121/78*
U.S. Cl. 260—465 E 1 Claim

1. A process for preparing a 4-amino-2,5-di(C_1–C_4) alkoxybenzonitrile which comprises first brominating a 1-acylamino-2,5-dialkoxybenzene with hydrogen bromide in the presence of an oxidizing agent in aqueous solution or with bromine in sulfuric acid, then converting the 1-acylamino-2,5-dialkoxy-4-bromo-benzene so obtained, by the reaction with

copper-I-cyanide in an inert solvent and in the presence of a dissolving promotor for the copper-cyanide to the 4-acylamino-2,5-dialkoxy-benzonitrile, and subsequently hydrolyzing the acylamino group.

3,933,888

PRODUCTION OF UNSATURATED ACIDS, ESTERS AND NITRILES, AND CATALYST THEREFOR

Francis W. Schlaefer, Pennsauken, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 6, 1972, Ser. No. 295,743

Int. Cl.² C07C *120/00, 69/52, 69/54, 57/02*

U.S. Cl. 260—465.9 **12 Claims**

1. A process for the production of α,β-ethylenically unsaturated acids, esters of said acids having 4 to 15 carbon atoms and nitriles which comprises reacting formaldehyde with an alkanoic acid, an ester of said acid having 3 to 14 carbon atoms, or an alkyl nitrile in the presence of a catalyst consisting of pyrogenic silica, with a total surface area of 150 to 300 square meters per gram, a total porosity volume of 3 to 15 cubic centimeters per gram and a pore size distribution such that pores having a diameter in excess of 100,000 A. and pores between 100,000 and 10,000 A. total at least 50% of the total pore content and less than 30% total pore content is of pores having a diameter of less than 1,000 A., with the remainder of pores in the range of 10,000 to 1,000 A., calcined with a base activating agent and where the reaction is carried out at a temperature of 330° to 390°C. with an alkanoic acid, ester or alkyl nitrile to formaldehyde molar concentration in the range of about 0.3–3.0:1.

3,933,889

4,5-CIS-DIDEHYDRO-PGF$_{1\alpha}$ ANALOGS

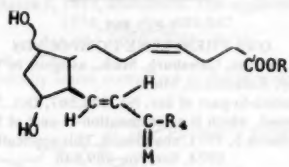
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 247,993, April 27, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,629

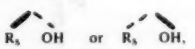
Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 D **10 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is



wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl or one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_4 is alkyl of 6 to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,890

10,11,15-TRIHYDROXYPROSTANOIC ACID

Michael Peter Lear Caton, Upminster, and Trevor Parker, Romford, both of England, assignors to May & Baker Limited, England

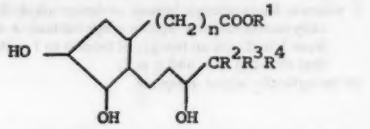
Division of Ser. No. 332,660, Feb. 15, 1973. This application Dec. 7, 1973, Ser. No. 423,376

Claims priority, application United Kingdom, Feb. 18, 1972, 7640/72

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 D **10 Claims**

1. A cyclopentane of the formula:



wherein R^1 represents hydrogen or alkyl of 1 through 12 carbon atoms, R^2 and R^3 represent hydrogen or alkyl of 1 through 4 carbon atoms, R^4 represents alkyl of 1 through 10 carbon atoms, and n represents 4 or 6, and, where R^1 represents hydrogen, non-toxic salts thereof.

3,933,891

11β,15β-PGF$_{1\alpha}$ COMPOUNDS

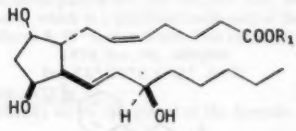
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 403,094, Oct. 3, 1973, Pat. No. 3,890,371, June 17, 1975, which is a division of Ser. No. 159,478, July 2, 1971, Pat. No. 3,772,350, Nov. 13, 1973, which is a continuation-in-part of Ser. No. 71,390, Nov. 11, 1970, now abandoned. This application July 8, 1974, Ser. No. 486,353

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 D **3 Claims**

1. The compound of the formula



wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substitued with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,892

ASYMMETRIC SYNTHESIS OF OPTICALLY ACTIVE PROSTAGLANDINS

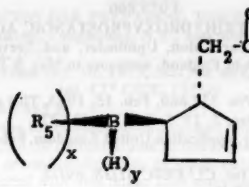
Naresh Kumar Chadha, Nutley; John Joseph Partridge, Jr., and Milan Radoje Uskokovic, both of Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 331,931, Feb. 12, 1973, abandoned. This application Jan. 18, 1974, Ser. No. 434,539

Int. Cl.² C07F *5/02*

U.S. Cl. 260—468 J **3 Claims**

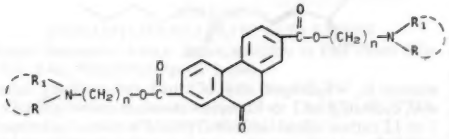
1. An optically active compound of the formula:



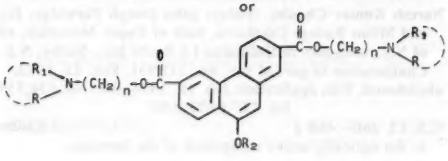
wherein R_1 is phenyl, benzyl or lower alkyl; R_5 is an optically active organo hydrocarbyl radical; x is an integer from 1 to 2; y is an integer of from 0 to 1 with the proviso that the sum of x and y is 2;
or its optically active antipode.

3,933,893
DERIVATIVES OF 9-PHENANTHRENE
Donald R. Meyer, and Arthur D. Sill, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.
Division of Ser. No. 317,146, Dec. 21, 1972, Pat. No. 3,859,312. This application Sept. 13, 1974, Ser. No. 505,661
Int. Cl.² C07C *93/20*
U.S. Cl. 260—468.5 **4 Claims**

1. A derivative of 9-phenanthrone having the formula:



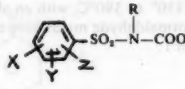
or



wherein n is an integer of from 2 to 6; R and R_1 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than in the 1-position of the alkenyl group, and when R and R_1 are taken together with the nitrogen atom to which they are attached represent the pyrrolidinyl, piperidino or morpholino radical; R_2 is selected from the group consisting of hydrogen or lower alkyl having from 1 to 4 carbon atoms; and the pharmaceutically acceptable acid addition salts thereof.

3,933,894
N-ARYLSULFONYL CARBAMATES
John A. Stephens, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.
Division of Ser. No. 547,376, May 3, 1966, Pat. No. 3,799,760, which is a continuation-in-part of Ser. No. 266,513, March 20, 1963, abandoned, which is a continuation-in-part of Ser. No. 256,840, Feb. 7, 1963, abandoned. This application Dec. 10, 1973, Ser. No. 423,330
Int. Cl.² C07C *149/40*
U.S. Cl. 260—470 **4 Claims**

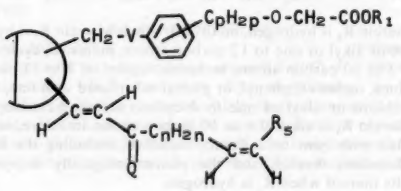
1. An amine salt, alkali metal salt or alkaline earth metal salt of a N-benzenesulfonyl carbamate of the formula



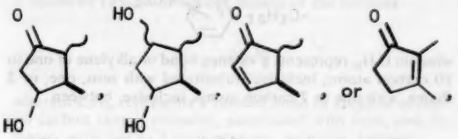
where X, Y, and Z are selected from the group consisting of hydrogen, chloro, bromo, iodo, nitro, and lower alkyl; where R is selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkenyl, alkynyl, aryl, alkaryl, aralkyl having up to 8 carbon atoms and lower alkanoyl; and where R_1 is selected from the group consisting of alkyl, cycloalkyl, alkenyl, alkynyl, aryl, alkaryl and aralkyl having up to 8 carbon atoms.

3,933,895
OXA-PHENYLENE COMPOUNDS
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,846
Int. Cl.² C07C *65/22, 61/76*
U.S. Cl. 260—473 A **5 Claims**

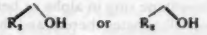
1. An optically active compound of the formula:



or a racemic mixture of that compound and its enantiomer, wherein D is one of the four carbocyclic moieties:



wherein ~ indicates attachment of the hydroxyl or the side chain to the cyclopentane ring in alpha or beta configuration; wherein V is (1) C_qH_{2q} or (2) —CH=CH—C_jH_{2j} wherein C_qH_{2q} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between —CH_2— and the phenylene ring, and wherein C_jH_{2j} represents a valence bond or alkylene of one to 2 carbon atoms with one chain carbon atom between —CH=CH— and the phenylene ring; wherein C_nH_{2n} is alkylene of one to 4 carbon atoms, inclusive; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between the ring and the —O—; wherein C_gH_{2g} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein Q is



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_5 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,896

PGF$_1$ β -OXA PHENYLENE COMPOUNDS

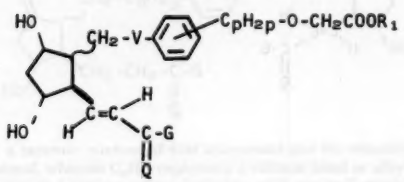
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,847

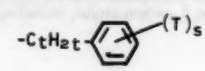
Int. Cl.^{2} C07C *65/92, 69/76*

U.S. Cl. 260—473 A **32 Claims**

1. An optically active compound of the formula

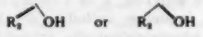


or a racemic mixture of that compound and the enantiomer thereof, wherein V is (1) C_qH_{2q} or (2) —CH=CH—C_jH_{2j} wherein C_qH_{2q} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between —CH_2— and the phenylene ring and wherein C_jH_{2j} represents a valence bond or alkylene of one or 2 carbon atoms with one chain carbon between —CH=CH— and the phenylene ring; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between the ring and the —O—; wherein C_gH_{2g} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_6, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, wherein ~ indicates attachment of the side chain to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,897

PGA$_1$-OXA-PHENYLENE COMPOUNDS

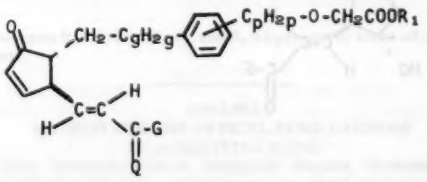
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,849

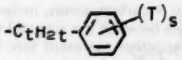
Int. Cl.^{2} C07C *65/22, 69/76*

U.S. Cl. 260—473 A **30 Claims**

1. An optically active compound of the formula:

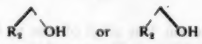


or a racemic mixture of that compound and the enantiomer thereof, wherein C_qH_{2q} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between —CH_2— and the ring; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms between the ring and the —O—; wherein C_qH_{2q} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a mono-valent moiety of the formula



wherein C_iH_{2i} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_6$, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,898

PGE$_1$-OXA PHENYLENE COMPOUNDS

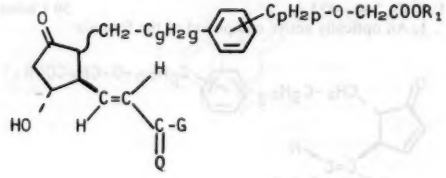
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,932

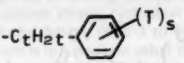
Int. Cl.^{2} C07C *65/22, 69/76*

U.S. Cl. 260—473 A **66 Claims**

1. An optically active compound of the formula:

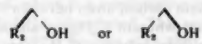


or a racemic mixture of that compound and the enantiomer thereof, wherein C_gH_{2g} represents a valence bond or alkylene of one or 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between $—CH_2—$ and the ring; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive; with one or 2 chain carbon atoms between the ring and —O—; wherein C_gH_{2g} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_iH_{2i} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_6$, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, wherein ~ indicates attachment of the side chain to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof and the pharamcologically acceptable salts thereof when R_1 is hydrogen.

3,933,899

PGE$_2$-OXA-PHENYLENE COMPOUNDS

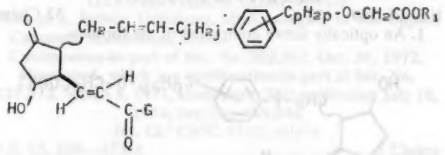
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,933

Int. Cl.^{2} C07C *65/22, 69/76*

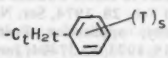
U.S. Cl. 260—473 A **31 Claims**

1. An optically active compound of the formula:



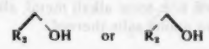
or a racemic mixture of that compound and the enantiomer thereof, wherein C_jH_{2j} represents a valence bond or alkylene of one or 2 carbon atoms, with one chain carbon atom between $—CH=CH—$ and the phenylene ring; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between the ring and —O—; wherein C_jH_{2j} and C_pH_{2p} together repre-

sent zero to 6 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_6$, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, wherein ~ indicates attachment of the side chain to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,900

PGE$_0$ OXA-PHENYLENE COMPOUNDS

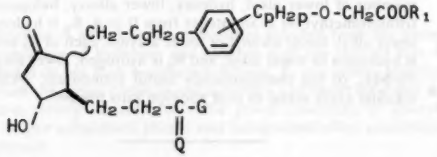
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,935

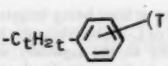
Int. Cl.² C07C *65/22, 69/76*

U.S. Cl. 260—473 A **31 Claims**

1. An optically active compound of the formula:

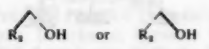


or a racemic mixture of that compound and the enantiomer thereof, wherein C_gH_{2g} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between $-CH_2-$ and the phenylene ring; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between the ring and the —O—; wherein C_gH_{2g} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, $-OR_6$, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein ~ indicates attachment of the side chain to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,933,901

PRECURSORS FOR PROSTAGLANDIN E$_1$

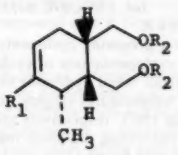
Zbigniew S. Zelawski, Piscataway, and Norman L. Wendler, Summit, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1973, Ser. No. 356,528

Int. Cl.² C07C *43/18, 69/08, 69/16, 69/28*

U.S. Cl. 260—488 R **5 Claims**

1. A compound of the formula



wherein R_1 is lower alkoxy, and R_2 is hydrogen or lower alkanoyl.

3,933,902

METHOD FOR THE OPTICAL RESOLUTION OF DL-α-PHENYLGLYCINE

Teiko Watanabe, Tokyo; Shigeyoshi Hayashi, Kurhshiki; Shunji Ouchi, Tokyo, and Saburo Senoo, Shiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

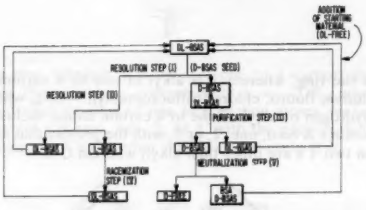
Filed Dec. 11, 1972, Ser. No. 313,729

Int. Cl.² C07C *143/26*

U.S. Cl. 260—501.12 **14 Claims**

1. A method for obtaining an optically active α-phenylglycine benzenesulfonate by optical resolution which comprises dissolving DL-α-phenylglycine benzenesulfonate in an aqueous solution of benzenesulfonic acid having a concentration greater than 5g of benzenesulfonic acid per 100 g of water, rendering the solution supersaturated, selectively crystallizing either optically active D- or L-α-phenylglycine benzenesulfon-

ate, crystallization at least being initiated in the presence of a seed of either D- or L-α-phenylglycine benzensulfonate corresponding optically to the optically active α-phenylglycine benzenesulfonate to be crystallized out, and separating the



resulting crystals from the liquid phase before initiation of crystallization of the optically active α-phenylglycine benzenesulfonate having an optical activity opposite to that of the crystallized optically active α-phenylglycine benzenesulfonate.

3,933,903

PROCESS FOR THE PREPARATION OF CYCLOALKYLALKANE CARBOXYLIC ACID

Reginoldus Havinga, Schalkhaar, and Antoon Wildschut, Bathmen, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed June 3, 1974, Ser. No. 475,875

Claims priority, application Netherlands, June 12, 1973, 7308108

Int. Cl.² C07C *61/38*

U.S. Cl. 260—514 R **8 Claims**

1. A process for preparing cyclopentylpropionic acid comprising reacting cyclopentanone or cyclopentanol

with molten alkali metal hydroxide in two successive heating steps at temperatures ranging from 200° to 270°C and from 290° to 350°C respectively and

subsequently converting the alkali metal soap of cyclopentylpropionic acid formed into the free acid.

3,933,904

11,15-DIHYDROXY-9,13-PROSTADIENOIC ACID

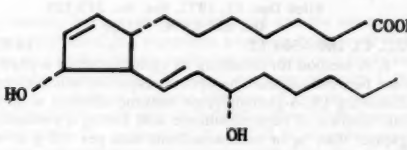
Donald P. Strike, Saint Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,804

Int. Cl.² C07C *61/38*; C07c *69/74*

U.S. Cl. 260—514 D **2 Claims**

1. A chemical compound of the structure:



wherein R is hydrogen or alkyl of from 1 to 6 carbon atoms.

3,933,905

(5-OXO-10,11-DIHYDRODIBENZO[A,D]-CYCLOHEPT-EN-2-YL)-ALKANOIC ACIDS

Jean-Paul Brunet, Creteil, and Andre Cometti, Paris, both of France, assignors to Rhone-Poulenc S.A., Paris, France

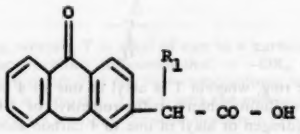
Filed Feb. 28, 1974, Ser. No. 447,059

Claims priority, application France, Mar. 2, 1973, 73.07508; Oct. 19, 1973, 73.37404; Jan. 23, 1974, 74.02214

Int. Cl.² C07C *65/20*

U.S. Cl. 260—515 R **4 Claims**

1. A dibenzo[a,d]cycloheptene of the formula:



wherein R_1 is hydrogen, methyl or ethyl, or the pharmaceutically acceptable non-toxic alkali metal, alkaline earth metal, ammonium and amine salts thereof.

3,933,906

3,4-BISAMINO-5-SULFAMOYLBENZOIC ACIDS

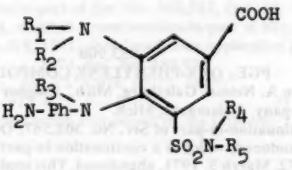
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 297,531, Oct. 13, 1972. This application Aug. 8, 1973, Ser. No. 386,651

Int. Cl.² C07C *143/52*

U.S. Cl. 260—518 R **4 Claims**

1. A compound corresponding to the formula



in which R_1 is lower alkyl, lower alkenyl, lower alkynyl, (monocyclic, 3 to 7 ring-membered cycloalkyl, cycloalkenyl, 2- or 7-norbornanyl or 2-norborn-5-enyl)-C_mH_{2m}, Ph is 1,2-, 1,3- or 1,4-phenylene, unsubstituted or substituted by one member of lower alkyl, hydroxy, lower alkoxy, halogeno or trifluoromethyl, m is an integer from 0 to 4, R_2 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl, each of R_3 and R_4 is hydrogen or lower alkyl, and R_5 is hydrogen, lower alkyl or Ph-NH_2, or the therapeutically useful ammonium, alkali or alkaline earth metal or acid addition salts thereof.

3,933,907

THIOPHOSPHORUS ACID AMIDES

Stanley Ashton; Vijay Ratna Sharma, and John Anthony Taylor, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

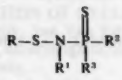
Filed Jan. 17, 1974, Ser. No. 434,302

Claims priority, application United Kingdom, Jan. 23, 1973, 3348/73. The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

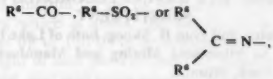
Int. Cl.² C07C *145/02*

U.S. Cl. 260—551 P **6 Claims**

1. An amide of the formula:



wherein R is alkyl of up to 18 carbon atoms, alkenyl of up to 18 carbon atoms, cycloalkyl containing 5–6 carbon atoms, phenyl, naphthyl, tolyl, β-methoxyethyl, β-cyanoethyl, 2-formylprop-2-yl, 4-chlorophenyl, 4-methoxyphenyl, 4-dimethylaminophenyl, 2-nitrophenyl, 4-nitrophenyl, 2,3,4,5,6-pentachlorophenyl, 2-methoxycarbonylphenyl or 4-phenylsulphonylphenyl, R^1 is hydrogen, alkyl of up to 18 carbon atoms, alkenyl of up to 18 carbon atoms, cycloalkyl containing 5–6 carbon atoms, phenyl, naphthyl, tolyl, β-methoxyethyl, β-cyanoethyl, 2-formylprop-2-yl, 4-chlorophenyl, 4-methoxyphenyl, 4-dimethylaminophenyl, 2-nitrophenyl, 4-nitrophenyl, 2,3,4,5,6-pentachlorophenyl, 2-methoxycarbonylphenyl or 4-phenylsulphonylphenyl or a group of the formula



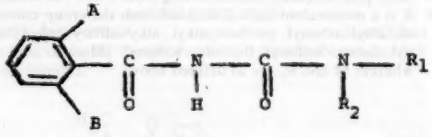
wherein R^6 is hydrogen or one of the values of R given above, one of R^2 and R^3 is R — S — NR^1 — and the other is R — S — NR^1 —, halogen, a value as recited for R or —OR wherein R and R^1, in each instance, have the meaning given above.

3,933,908
SUBSTITUTED BENZOYL UREAS

Kobus Wellinga, and Rudolf Mulder, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 143,668, May 14, 1971, Pat. No. 3,748,356. This application Apr. 25, 1973, Ser. No. 354,393
Claims priority, application Netherlands, May 15, 1970, 7007040
Int. Cl.² C07C *127/22*
U.S. Cl. 260—553 E **25 Claims**

1. A compound of the formula



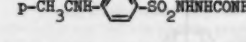
wherein A and B are each moieties selected from the group consisting of hydrogen and halogen with the proviso that A and B do not both represent hydrogen, R_1 is a moiety selected from the group consisting of hydrogen and lower alkyl and R_2 is a moiety selected from the group consisting of phenyl, halogen substituted phenyl and halogenated alkyl substituted phenyl.

3,933,909
METHOD FOR PRODUCING SULFONYL SEMICARBAZIDES

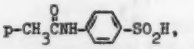
John E. Herweh, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed July 19, 1974, Ser. No. 490,039
Int. Cl.² C07C *133/02*, *159/00*
U.S. Cl. 260—554 **2 Claims**

1. A process for the manufacture of a sulfonyl semicarbazide of the formula



which comprises forming a precipitate by reacting in a dipolar aprotic solvent an azobisformamide of the formula $H_2NCON=NCONH_2$ with a free sulfinic acid of the formula



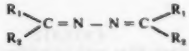
dissolving said precipitate in aqueous alkali, filtering said alkaline solution formed thereby, neutralizing said alkaline solution and recovering said sulfonyl semicarbazide.

3,933,910
PROCESS FOR THE PRODUCTION OF KETAZINES

Helmut Waldmann, Leverkusen; Hermann Seifer, Cologne; Wulf Schwerdtel, Leverkusen; Wolfgang Swodenk, Odenthal-Gloebusch, and Kurt-Wilhelm Eichenhofer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 14, 1974, Ser. No. 469,939
Claims priority, application Germany, May 19, 1973, 2325460
Int. Cl.² C07C *119/00*
U.S. Cl. 260—561 A **8 Claims**

1. In the production of a ketazine corresponding to the general formula

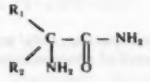


in which

R_1 and R_2 are independently linear or branched alkyl radicals of from 1 to 8 carbon atoms, a phenyl radical, a cyclic alkyl radical with 5 to 8 carbon atoms, or taken together with the carbon atoms to which they are attached represent a carbocyclic ring with 5 to 8 carbon atoms, by reacting ammonia, hydrogen peroxide, a -CN containing compound and a ketone of the general formula

R_1 - CO - R_2

in which R_1 and R_2 are as defined above, the improvement which comprises using hydrocyanic acid as said -CN containing compound and effecting said reaction at from -20°C to 100°C, whereby said ketazine is produced along with an α-amino carboxylic acid amide of the formula

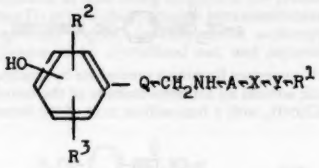


3,933,911
1-ARYL-2-AMIDOALKYLAMINOETHANOL DERIVATIVES

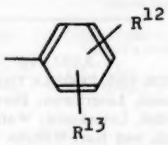
Brian Geoffrey Main, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 5, 1974, Ser. No. 485,994
Claims priority, application United Kingdom, July 19, 1973, 34465/73
Int. Cl.² C07C *103/38*
U.S. Cl. 260—562 N **7 Claims**

1. A phenylethylamine derivative selected from compounds of the formula:



wherein A is alkylene of up to 6 carbon atoms, wherein Q is carbonyl or hydroxymethylene, wherein R^1 is alkyl or cycloalkyl each of up to 6 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino or hydroxymethyl, alkyl, alkoxy or acylamino each of up to 6 carbon atoms, or aryl of up to 12 carbon atoms, wherein X is NHCO and wherein Y is a direct link, or is alkylene or alkyleneoxy each of up to 6 carbon atoms; and the acid-addition salts thereof.

3,933,912

SUBSTITUTED PHENYLTHIOAMIDINES

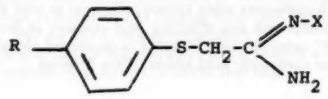
Earl R. Bockstahler, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 401,475, Sept. 27, 1973, which is a division of Ser. No. 257,940, May 30, 1972, Pat. No. 3,775,478. This application July 8, 1974, Ser. No. 486,705

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 G **2 Claims**

1. A substituted phenylthio amidine compound selected from the group consisting of compounds corresponding to the formula



wherein R represents tertiary butyl and X represents hydroxyl, and the salts thereof of pharmaceutically acceptable acids.

3,933,913

N,N′-BIS[2-(3-SUBSTITUTED-4-HYDROXYPHEYL)-2-HYDROXYETHYL)]-POLYMETHYLENEDIAMINES

Donald F. Colella, Philadelphia, Pa., and Carl Kaiser, Haddon Heights, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

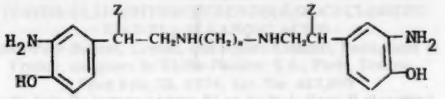
Continuation-in-part of Ser. No. 148,912, June 1, 1971, abandoned. This application Sept. 8, 1972, Ser. No. 287,399

Claims priority, application South Africa, May 25, 1972, 72/3611

Int. Cl.² C07C *91/22*

U.S. Cl. 260—570.6 **2 Claims**

1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

n is a positive whole integer from 4 to 8; and

Z is hydroxy.

3,933,914

ORGANIC DYE HAVING FLUOROALIPHATIC SUBSTITUENT

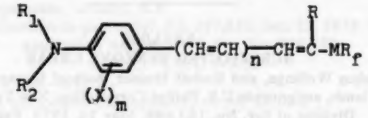
Robert F. Coles, and Ivan H. Skoog, both of Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1972, Ser. No. 300,752

Int. Cl.² C07C *87/52*

U.S. Cl. 260—577 **8 Claims**

1. A compound having the general formula



wherein R_1 and R_2 are hydrogen, alkyl, haloalkyl, phenyl, or benzyl, *n* is the integer zero, 1 or 2, X is hydrogen, halogen, alkyl having from 1-3 carbon atoms, nitro, or alkoxy having from 1-3 carbon atoms, and *m* is the integer 1 to 3, M is a divalent bridging radical selected from the group consisting of sulfonyl, carbonyl, and carbonyloxy, R_f is a monovalent saturated perfluoroalkyl radical having from 1 to 8 carbon atoms, R is a monovalent radical selected from the group consisting of, alkylcarbonyl, perfluoroalkyl, alkylsulfonyl, phenylsulfonyl, nitro, sulfonyl fluoride, sulfonyl chloride, and MR_f wherein M and R_f are as defined above.

3,933,915

INSECT REPELLENT COMPOSITIONS AND PROCESS HAVING AN N-SUBSTITUTED HYDROXYALKYL AMINE AS AN ACTIVE INGREDIENT

Carl Bordenca, Rocky River, Ohio; Kenneth P. Dorschner, Vienna, Va., and Robert P. Johnson, Baton Rouge, La., assignors to SCM Corporation, Cleveland, Ohio

Continuation of Ser. No. 265,673, June 23, 1972, abandoned, which is a continuation-in-part of Ser. No. 189,464, Oct. 14, 1971, abandoned. This application May 16, 1974, Ser. No. 470,632

Int. Cl.² C07C *91/04, 91/06*

U.S. Cl. 260—584 R **5 Claims**

1. A hydroxyalkyl amine selected from the group consisting of: N-(2-hydroxy-1,1-dimethylethyl)-di(3,7-dimethyloctyl) amine, N-(2-hydroxy-1,1-dimethylethyl) geranyl amine, N-(2-hydroxy-1,1-dimethylethyl) digeranyl amine, and N-(2-hydroxyethyl) geranyl amine.

3,933,916
PURIFICATION OF CYCLOHEXANONE

Pierre Lejeune, Wilrijk; Jan Van Esbroeck, and Pol Bamelis, both of Kalmthout, all of Belgium, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 13, 1973, Ser. No. 397,143
Claims priority, application Germany, Sept. 20, 1972, 2246103
Int. Cl.² C07C *45/24*
U.S. Cl. 260—586 R **5 Claims**

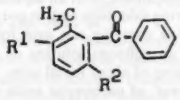
1. A process for recovering cyclohexanone produced by the air oxidation of cyclohexane or by the hydrogenation of phenol which comprises the steps of dissolving the reaction product of the aforesaid oxidation or hydrogenation in a solvent for cyclohexanone which is readily separated from cyclohexanone by distillation and which is selected from the group consisting of aromatic, aliphatic and cycloaliphatic hydrocarbons of 5 to 15 carbon atoms, alkanols and cycloalkanols of 1 to 10 carbon atoms and their corresponding linear and cyclic ethers having a total of 4 to 15 carbon atoms, treating said solvent solution for up to 30 minutes with an acid at a temperature which is above the solidification point of the solution and up to 150°C. in an amount of from 1 ppm to 1 part by weight of acid per 100 parts by weight of cyclohexanone solution, said acid being selected from the group consisting of mineral acids which do not have an oxidizing effect under said treatment conditions; acidic salts thereof; aliphatic, cycloaliphatic, aromatic and araliphatic carboxylic acids; aliphatic, cycloaliphatic, aromatic and araliphatic sulfonic acids; acid ion exchange resins containing carboxyl groups and acid ion exchange resins containing sulfonyl groups and subsequently distilling said treated solution to recover cyclohexanone.

3,933,917
PRODUCTION OF DIMETHYLBENZOPHENONE

Ernst Schaffner, Ludwigshafen; Heinz Eilingsfeld, Frankenthal, and Manfred Patsch, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 29, 1973, Ser. No. 392,822
Claims priority, application Germany, Sept. 2, 1972, 2243283
Int. Cl.² C07C *49/76*
U.S. Cl. 260—591 **6 Claims**

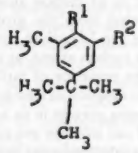
1. A process for the production of dimethylbenzophenone of the formula



(II)

in which one of the two radicals R^1 and R^2 is hydrogen and the other is methyl, which process comprises:

a. reacting a benzoyl halide in a first benzoylation step with a tert.-butylxylene of the formula



(I)

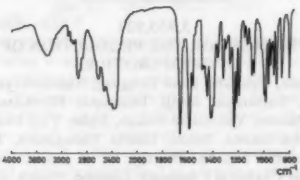
in which one of R^1 and R^2 is hydrogen and the other is methyl, in the presence of a catalytic amount of about 0.5 to 7% by weight of ferric chloride, with reference to the benzoyl halide, at a temperature of −10°C. to +220°C.; and

b. reacting in a second dealkylation step the reaction mixture thus formed in said first step in the presence of about 1 to 1.5 moles of aluminum chloride per mole of the initial compound (I) at a temperature of 30°C. to 150°C.

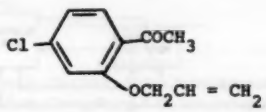
3,933,918
2-ALLYLOXY-4-CHLORO-ACETOPHENONE

Arihiro Yamada, Takaishi, and Kyoichi Fujii, Sakai, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Sept. 3, 1974, Ser. No. 502,776
Claims priority, application Japan, Sept. 4, 1973, 48-98923
Int. Cl.² C07C *49/78*
U.S. Cl. 260—592 **1 Claim**



1. A compound of the formula:



3,933,919
HYDROFORMYLATION OF MONO-α-OLEFINS AND MONO-α-ACETYLENES

Geoffrey Wilkinson, 6 Tennul Close, London W. 2, England

Continuation of Ser. No. 821,521, Feb. 10, 1968, abandoned, Division of Ser. No. 541,118, Dec. 15, 1965, abandoned. This application Mar. 4, 1974, Ser. No. 447,827
Claims priority, application United Kingdom, Dec. 15, 1964, 50984/64; Feb. 16, 1965, 6676/65; Oct. 5, 1965, 42138/65
Int. Cl.² C07C *45/10*
U.S. Cl. 260—604 HF **3 Claims**

1. A hydroformylation process comprising reacting hydrogen and carbon monoxide with a mono-α-olefinically or mono-α-acetylenically unsaturated aliphatic hydrocarbon, said process being carried out at a temperature in the range of 50°–150° C at a pressure of 5 to 100 atmospheres and in the presence of a liquid reaction medium having dissolved therein a catalytic quantity of a catalyst having the formula $L_nM^rX_y$, wherein L is a ligand molecule having a donor atom selected from the class consisting of phosphorus and arsenic, said donor atom having a pair of electrons available for donation to metal atom M; *n* is the number of ligand molecules present and is a positive integer having a value of at least one and less than 4; M is a metal atom selected from the class consisting of ruthenium, osmium, rhodium, iridium, palladium and platinum, *r* is the valency state of said metal atom and is a positive integer having a value of from 1 to 4; X is a halogenoid moiety selected from the class consisting of halogen, cyanide, cyanate and thiocyanate; Y is the number of halogenoid moieties present and is an integer having a value of from 1 to 3.

3,933,920

PRODUCTION OF α, ω-DIALDEHYDES

Hans Juergen Nienburg, Heidelberg, and Rudolf Kummer, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 12, 1974, Ser. No. 450,284

Claims priority, application Germany, Mar. 24, 1973, 2314694

Int. Cl.² C07C 47/12

U.S. Cl. 260—604 HF 7 Claims

1. An improved process for the production of an α,ω-dialdehyde by reaction of a linear α,ω-diolefin having isolated double bonds with carbon monoxide and hydrogen at elevated temperature and at superatmospheric pressure in the presence of a cobalt carbonyl complex, wherein the improvement comprises supplying the cobalt to the reaction in the form of cobalt carbonyl hydride which is dissolved in the α,ω-diolefin to be used or in an inert organic solvent and carrying out the reaction at a temperature of from 70° to 130°C.

3,933,921

PROCESS FOR THE PRODUCTION OF HYDROPEROXIDES

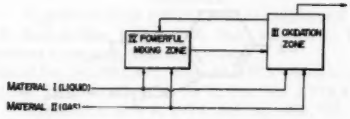
Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 18, 1973, Ser. No. 370,673

Claims priority, application Japan, June 23, 1972, 47-63510

Int. Cl.² C07C 179/02, 179/04

U.S. Cl. 260—610 B 6 Claims



1. In a process for the production of hydroperoxides by the oxidation of an aromatic hydrocarbon having at least one tertiary carbon atom selected from the group consisting of cumene, cymene, butylbenzene, diisopropyltoluene, diisopropylbenzene, isopropylnaphthalenes and diisopropylnaphthalenes with oxygen or an oxygen containing gas in the presence of an aqueous alkaline solution, at a temperature of 80° to 150°C and at pH of 5 to 12, the improvement which comprises conducting the oxidation by forming an emulsion phase by powerfully mixing at least part of said aromatic hydrocarbons and said aqueous alkaline solution, said mixing being performed by powerfully mixing an intermediate reaction mixture obtained after the oxygen has initially reacted with the aromatic hydrocarbon and containing said aqueous alkaline solution.

3,933,922

SUBSTITUTED POLYHALOGENATED CYCLOPENTADIENES

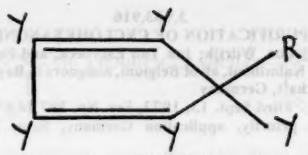
Victor Mark, Ransomville, N.Y., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 135,391, April 19, 1971, Pat. No. 3,799,994, Continuation-in-part of Ser. No. 786,429, Dec. 23, 1968, abandoned, which is a continuation-in-part of Ser. No. 44,890, July 25, 1960, Pat. No. 3,478,117. This application Dec. 6, 1973, Ser. No. 422,246

Int. Cl.² C07C 43/18

U.S. Cl. 260—611 R 3 Claims

1. Compound of the formula



wherein Y is a halogen of atomic weight between 35 and 80; R is alkoxyalkyl having at least 2 and a maximum of 6 carbon atoms.

3,933,923

PROCESS FOR THE MANUFACTURE OF VICINAL GLYCOLS

Rainer Osberghaus, Dusseldorf-Urdenbach, and Werner Stein, Erkrath-Unterbach, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

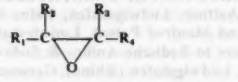
Filed Nov. 7, 1973, Ser. No. 413,690

Claims priority, application Germany, Nov. 20, 1972, 2256907

Int. Cl.² C07C 29/00, 41/02

U.S. Cl. 260—615 R 9 Claims

1. In the process for the preparation of higher vicinal diols and/or higher vicinal polyols comprising hydrolyzing the corresponding epoxides of the formula



in which R_1, R_2, R_3 and R_4 are each selected from the group consisting of hydrogen, alkyl having 1 to 28 carbon atoms, haloalkyl having 1 to 28 carbon atoms, alkoxyalkyl having 2 to 28 carbon atoms, epoxyalkyl having 3 to 28 carbon atoms, haloepoxyalkyl having 3 to 28 carbon atoms, alkoxyepoxyalkyl having from 4 to 28 carbon atoms, and mixtures thereof, with the proviso that the total number of carbon atoms in the epoxide is from 4 to 30 carbon atoms, with an aqueous solution of a catalyst, and recovering said diols and/or polyols; the improvement which comprises carrying out said hydrolysis with a catalyst consisting of an aqueous solution of salts selected from the group consisting of alkali metal salts, alkaline earth salts and mixtures thereof, of carboxylic acids selected from the group consisting of (a) alkanoic acids having from 8 to 22 carbon atoms with at least 0.5 parts by weight per part by weight of said epoxides of dissolving intermediaries, (b) alkanedioic acids having 3 to 24 carbon atoms, (c) alkenedioic acid having 4 to 24 carbon atoms, and (d) a mixture of at least one monocarboxylic acid selected from the group consisting of an alkanoic acid having 1 to 24 carbon atoms and an alkenoic acid having 3 to 24 carbon atoms with at least one dicarboxylic acid selected from the group consisting of an alkanedioic acid having 3 to 24 carbon atoms and an alkenedioic acid having 4 to 24 carbon atoms, at a temperature above 100°C, optionally in the presence of further dissolving intermediaries, said aqueous solution of said salts containing 1% to 20% of said salts and being present in an amount of at least 0.5 parts by weight of said salt solution per part by weight of said epoxide, said dissolving intermediaries being selected from the group consisting of water-soluble alkanones and water-soluble cyclic hydrocarbon ethers,.

3,933,924

PROCESS FOR PREPARING HYDROXYDIPHENYL

Oskar Weissel, Krefeld; Horst Köller, Krefeld-Veeberg, and Hans-Helmut Schwarz, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

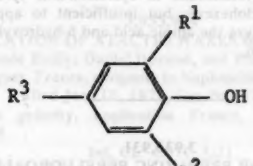
Filed Mar. 11, 1974, Ser. No. 450,252

Claims priority, application Germany, Mar. 26, 1973, 2314950

Int. Cl.² C07C *37/06*

U.S. Cl. 260—620 5 Claims

1. In the process for the production of hydroxydiphenyl, which comprises dehydrogenating a starting material comprising completely or partly hydrogenated hydroxydiphenyl in the gaseous phase in the presence of a dehydrogenation catalyst containing nickel, chromium, aluminum, copper and an alkali compound selected from the group of alkali metal sulfate and alkali metal carbonate, the improvement which comprises adding a stabilizer having the formula (I):



(I)

wherein:

R^1, R^2 and R^3, which may be the same or different, each represents a linear or optionally branched alkyl radical having up to 6 carbon atoms, in addition to which R^3 can also represent a hydrogen atom, to the starting material before it comes into contact for the first time with oxygen-containing gases and the dehydrogenation catalyst.

3,933,925

HYDROLYSIS OF TOLUENE DIAMINES TO PRODUCE METHYL RESORCINOLS

Nicholas P. Greco, Edgewood, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 267,525, June 29, 1972, Pat. No. 3,862,247, which is a continuation-in-part of Ser. No. 16,545, March 4, 1970, abandoned. This application Jan. 17, 1975, Ser. No. 542,087

Int. Cl.² C07C *39/08*

U.S. Cl. 260—621 M 7 Claims

1. A method of making methyl resorcinol comprising:

a. contacting toluene diamine with ammomium bisulfate in an aqueous solution that contains 4 to 12 moles of ammonium bisulfate per mole of toluene diamine and 40 to 120 moles of water per mole of toluene diamine and that is at a temperature of 200° to 300°C. for a period of one-half to eight hours to hydrolyze said toluene diamine to methyl resorcinol,

b. cooling said hydrolysis reaction mixture, and

c. extracting said methyl resorcinol from said solution with a water-immiscible organic solvent.

3. The method of making methyl resorcinol comprising:

a. contacting toluene diamine with ammonium bisulfate in an aqueous solution that contains 4 to 12 moles of ammonium bisulfate per mole of toluene diamine and 40 to 120 moles of water per mole of toluene diamine and that is at a temperature of 200° to 260°C. for a period of one-half to eight hours to hydrolyze said toluene diamine to methyl resorcinol.

b. cooling said hydrolysis reaction mixture,

c. extracting said methyl resorcinol from said solution with an inert water-immiscible organic solvent, thereafter

d. evaporating the water from said solution to obtain a residue consisting essentially of ammonium sulfate and ammonium bisulfate, and

e. heating said residue to an elevated temperature of 210° to 450°C. to convert said ammonium sulfate to ammonium bisulfate for reuse to hydrolyze more toluene diamine to methyl resorcinol.

3,933,926

PREPARATION OF NITROPHENOLS

David Anthony Salter, 35, Roseacres, Takely, Essex, England, and Robert John James Simkins, 3, Upper Park, Harlow, Essex, England

Continuation of Ser. No. 880,981, Nov. 28, 1969, abandoned. This application May 30, 1973, Ser. No. 365,208

Claims priority, application United Kingdom, Nov. 29, 1968, 56724/68; Aug. 27, 1969, 42571/69

Int. Cl.² C07C *79/26*, *79/30*

U.S. Cl. 260—622 P 10 Claims

1. A process for the preparation of polynitrophenols comprising adding over a period of time sufficient to form said polynitrophenols, a liquid suspension containing from about 4 to about 20 percent weight/volume of a nitrosated phenol selected from the group consisting of nitrosated phenol, nitrosated m-cresol, nitrosated resorcinol, nitrosated phloroglucinol, nitrosated 3,5,dimethyl phenol, nitrosated 3-methoxy phenol and nitrosated naphthol to a nitric acid solution containing between 45 and 100 percent by weight of nitric acid, said solution being maintained at a temperature in the range from about 45° to 100°C., said nitrosated compound containing at least one nitroso group, said polynitrophenol containing at least the same number of nitro groups as nitroso groups on said nitrosated compound.

3,933,927

PHENOL TRANSALKYLATION PROCESS

Lloyd E. Goddard, Orangeburg, S.C., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 20,115, March 16, 1970, abandoned. This application Apr. 13, 1973, Ser. No. 351,015

Int. Cl.² C07C *39/06*

U.S. Cl. 260—624 E 2 Claims

1. A process for selectively ortho-transalkylating phenol, said process comprising mixing said phenol with 2,6-di-sec-butylphenol and about 0.01 to 0.1 mole parts per mole part of phenol and 2,6-di-sec-butylphenol of an aluminum phenoxide and heating the mixture in a closed system to a temperature of about 100°–350°C whereby a sec.-butyl group from the 2,6-di-sec-butyl phenol is thereby transferred selectively to an ortho position of the phenol.

3,933,928

METHOD FOR PRODUCING 2,6-DI-TERT.-BUTYL-4-CUMYL PHENOL

Kunio Hanauye; Tsutomu Takase, both of Nagoya; Mitsuhiro Iwasa, Tokai, and Mizuo Ito, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,546

Claims priority, application Japan, Aug. 27, 1973, 48-95139

Int. Cl.² C07C *39/06*

U.S. Cl. 260—626 R 6 Claims

1. A method for producing 2,6-di-tert.-butyl-4-cumyl phenol by reacting p-cumyl phenol with isobutylene which comprises conducting the reaction in the presence of p-toluene sulfonic acid in an amount of from 0.01 to 20% by weight based upon the amount of p-cumyl phenol and at a reaction temperature of from 40° to 120°C.

3,933,929
PROCESS FOR THE PURIFICATION OF P-NITROPHENOL

Gilbert Colovray, Peage-du-Roussillon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 14, 1973, Ser. No. 360,097
Claims priority, application France, May 15, 1972, 72.17254
Int. Cl.[2] C07C *37/22, 37/40*
U.S. Cl. 260—627 G **9 Claims**

1. In a process for the purification of p-nitrophenol resulting from the nitration of phenol with nitric acid which comprises the steps of:

i. separating the crude mixture of nitrophenols from the residual aqueous solution of nitric acid;

ii. steam distilling ortho-nitrophenol from the crude mixture to produce a crude aqueous solution of impure p-nitrophenol;

iii. treating at least one of the crude aqueous solution of p-nitrophenol and the crude mixture of nitrophenols with an aqueous solution of sodium bisulphite under condition such that the crude solution or crude mixture contains more than 0.5% by weight of sodium bisulphite and is at pH 5.4 to 6.4;

iv. crystallising p-nitrophenol by cooling the treated solution of step (iii), the improvement which comprises:

v. stirring the crystalline p-nitrophenol from step (iv) in water at a temperature of 55° to 85°C., the proportions of water and p-nitrophenol being such that, at that temperature there is a 10 to 40% by weight excess of p-nitrophenol relative to the amount of p-nitrophenol which is soluble in the water at that temperature,

vi. separating by decantation the liquid mixture resulting from step (v) at a temperature of 55° to 85°C., into a more concentrated solution of p-nitrophenol in water, which forms the lower layer, and a less concentrated solution of p-nitrophenol in water, which forms the upper layer,

vii. cooling the upper layer, obtained in step (vi) to a temperature of 40° to 50°C., separating the resulting liquid mixture by decantation into two non-miscible phases and separating the more concentrated solution of p-nitrophenol in water, from the less concentrated solution of p-nitrophenol in water,

viii. cooling the more concentrated solution from step (vii), to below 30°C. to cause p-nitrophenol to crystallise, and then filtering off and drying the crystals of p-nitrophenol.

3,933,930
HEXANEDIOL FROM CYCLOHEXANE

Edward F. Dougherty, and Charles C. Hobbs, Jr., both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 6, 1975, Ser. No. 555,920
Int. Cl.[2] C07C *29/00*
U.S. Cl. 260—635 D **6 Claims**

1. In a process for the production of 1,6-hexanediol from cyclohexane wherein:

a. cyclohexane is oxidized in the liquid phase in the presence of molecular oxygen and an oxidation catalyst at elevated temperatures and superatmospheric pressures to produce an oxidation product;

b. said oxidation product is separated into a non-acid fraction comprising cyclohexanol or cyclohexanone or mixtures thereof and an acid fraction comprising C_1 to C_6 monocarboxylic and dicarboxylic acids, substantially adipic acid and 6-hydroxyhexanoic acid and also 1,4-dihydroxycyclohexane and/or precurrors thereof;

c. said acid fraction is esterified by reacting same in the liquid phase with a C_2-C_{10} monohydric or dihydric alkane alcohol under esterification conditions so as to esterify at least a portion of the adipic acid and 6-hydroxyhexanoic acid contained in said acid fraction;

d. the ester product obtained by esterifying said acid fraction is reacted while in a liquid phase with molecular hydrogen under hydrogenolysis conditions including elevated temperature and superatmospheric pressure and in the presence of a catalytic amount of a hydrogenolysis catalyst to hydrogenolyze the esters of adipic acid and 6-hydroxyhexanoic acid so as to form 1,6-hexanediol and said alkane alcohol; and

e. separating 1,6-hexanediol from the product of said hydrogenolysis;

the improvement which comprises a prehydrogenation of said acid fraction prior to esterification thereof by reacting said acid fraction while in a liquid phase with molecular hydrogen at temperatures within the range of about 100° to 350°C and pressures within the range of about 50 to 400 atmospheres absolute, and in the presence of a metallic hydrogenation catalyst of copper, cobalt, platinum or palladium or mixtures thereof sufficient to convert a substantial portion of said 1,4-dihydroxycyclohexane to cyclohexanol, cyclohexane and/or cyclohexene, but insufficient to appreciably hydrogenolyze the adipic acid and 6-hydroxyhexanoic acid therein.

3,933,931
PROCESS FOR PREPARING PERFLUOROALKYL IODIDES

Yoshio Oda, and Manabu Suhara, both of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1971, Ser. No. 187,867
Claims priority, application Japan, Oct. 9, 1970, 45-88337
Int. Cl.[2] C07C *17/04, 19/07*
U.S. Cl. 260—653 **11 Claims**

1. A process for preparing perfluoroethyl iodide by the reaction of iodine, iodine pentafluoride and tetrafluoroethylene, in which the molar ratio of iodine to iodine pentafluoride is at least 1 : 1 and the molar ratio of tetrafluoroethylene to iodine pentafluoride is at least 3 : 1 and the reaction is carried out in the presence of a catalyst selected from the group consisting of niobium fluoride, tantalum fluoride, boron fluoride, and molybdenum fluoride and at a temperature of from 0°C to 150°C. and a pressure of from atmospheric pressure to 200 atmospheres, and wherein said reaction is carried out in the liquid phase in a liquid inert medium wherein liquid iodine pentafluoride or perfluoroalkyl iodide and catalysts are first introduced into the reaction zone and then tetrafluoroethylene is added.

3,933,932
METHOD OF OXYDEHYDROGENATION OF ETHYL BENZENE

G. Edwin Vrieland, Midland, Mich., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1974, Ser. No. 474,126
Int. Cl.[2] C07C *5/48*
U.S. Cl. 260—669 R **7 Claims**

1. A method of oxydehydrogenating ethyl benzene to styrene comprising feeding a mixture of from about 0.5 to about 4.0 moles of oxygen per mole of ethyl benzene, into admixture with a catalyst consisting essentially of lanthanum phosphate, lanthanum pyrophosphate, a rare earth phosphate having a predominant amount of lanthanum in the metal moiety or a rare earth pyrophosphate having a predominant amount of lanthanum in the metal moiety, at a reaction temperature of from about 450° to about 650°C., and a space velocity of from about 55 to about 2500 and recovering styrene from the effluent.

3,933,933

OXIDATIVE DEHYDROGENATION PROCESSES

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 245,382, April 19, 1972, Pat. No. 3,821,324. This application Mar. 15, 1974, Ser. No. 451,476

Int. Cl.² C07C *5/48*

U.S. Cl. 260—680 E **4 Claims**

1. A process for the oxidative dehydrogenation of a dehydrogenatable hydrocarbon feedstock having from 2 to 12 carbon atoms which comprises contacting said feedstock under dehydrogenation conditions in the presence of molecular oxygen with a catalyst consisting of titanium, molybdenum, lead and combined oxygen, said catalyst characterized by the expression

$$TiMo_xPb_yO_z$$

wherein x and y are numbers in the range of about 0.01 to about 5 and z is a number determined by the valence requirements of said titanium, molybdenum and lead.

3,933,934

FABRICATION OF ATACTIC WAXES OF POLYOLEFIN

Jean Claude Bailly; Daniel Durand, and Pierre Mangin, all of Martigues, France, assignors to Naphtachimie, Paris, France

Filed Jan. 18, 1973, Ser. No. 324,898

Claims priority, application France, Jan. 20, 1972, 72.01829

Int. Cl.² C07C *3/21*

U.S. Cl. 260—683.15 D **9 Claims**

1. A process for the manufacture of atactic waxes which are substantially completely soluble in boiling n-heptane by polymerizing propylene alone or with the addition of not more than 30% by weight monoolefins having the general formula $CH_2 = CHR$ in which R is hydrogen or an alkyl radical containing 2 to 8 carbon atoms in which the polymerization is carried out at low pressure and in a hydrocarbon solvent in the presence of a catalytic system formed of (a) a catalyst prepared in a one step reaction between magnesium, an alkyl halide and a titanium compound having the general formula $TiX_{4-m}(OR')_m$ in which Ti represents titanium, X represents a halogen atom, R′ represents an alkyl radical having from 2 to 8 carbon atoms and m is a number within the range of 1 to 4, in which the titanium compound is present in an amount to provide 0.5 to 2 milligram-atoms of titanium per liter of solvent, and (b) a co-catalyst in the form of an organo aluminum compound having the formula AlR''_nX_{3-n}, in which R″ represents an alkyl radical having from 1 to 12 carbon atoms, some of which may be replaced by hydrogen atoms, X is a halogen atom and n is a number within the range of 1 to 3, the organo aluminum compound being present in an amount such that the atomic ratio of aluminum to titanium in the catalyst is within the range of 2 to 10.

3,933,935

FLEXIBLE VINYL ESTER RESIN COMPOSITIONS

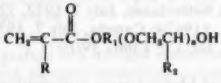
George Zachariades, Alvin, and Rhetta Q. Davis, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1974, Ser. No. 495,710

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **8 Claims**

1. A thermosettable resin composition which comprises the reaction about equivalent proportions of a polyepoxide and a dicarboxylic acid half ester of a monomer having the formula



where R is H or methyl, R_1 is an alkylene group having two to four carbon atoms, R_2 is H, methyl or ethyl and n has an average value of 3 to 6.

3,933,936

RAPID SETTING ADHESIVE COMPOUNDS

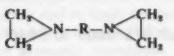
Harry A. Smith, and Erwin H. Kobel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 20, 1973, Ser. No. 334,059

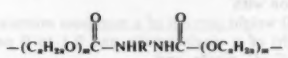
Int. Cl.² C08L *63/00*

U.S. Cl. 260—841 **11 Claims**

1. An adhesive composition comprising a curable phenolic-formaldehyde resin and from about 0.5 to about 20 parts by weight of an organic diaziridine, wherein said phenolic-formaldehyde resin is a novolac or a resole obtained by reacting formaldehyde with a monohydric or dihydric phenol or mixture thereof having at least two aromatic ring positions ortho or para to a phenolic hydroxyl group unsubstituted and capable of reaction with formaldehyde in the presence of a basic, neutral, or acidic condensation catalyst wherein said diaziridine has the formula



and R is a radical represented by the formula



wherein m is zero or one, n is two or three, and R′ is an alkylene radical of 2—10 carbon atoms, an arylene hydrocarbon radical or 6–14 carbon atoms, or the residue of the compound obtained by the reaction of two moles of an aromatic or aliphatic diisocyanate with a diol, the diol being ethylene glycol, propylene glycol, a corresponding polyglycol or molecular weight up to about 1000, Bisphenol A, or the adduct of Bisphenol A with two to about 20 moles of ethylene oxide or propylene oxide.

3,933,937

MOLDING-GRADE POLYURETHANE

Richard D. Rhodes, Jr., Somersworth, and William M. Humphrey, Jr., Dover, both of N.H., assignors to McCord Corporation, Detroit, Mich.

Filed May 15, 1974, Ser. No. 469,946

Int. Cl.² C08L *27/00*

U.S. Cl. 260—859 R **5 Claims**

1. An injection molding-grade thermoplastic polyurethane having good low temperature properties made by reacting the following:

Grafted polyol, PBW	100
Aromatic Polyisocyanate, to FNCO of	7 to 15
C_2–C_6 alkane diol, PBW	5 to 30

wherein:

said grafted polyol is a 2000 to 5000 molecular weight copolymer of:

a. 70 to 90 weight percent of a 1000 to 4000 molecular weight poly (oxy C_1–C_4 alkene) diol, reacted by free radical polymerization with

b. 10 to 30 weight percent of a monomer mixture of 1 part by weight of a vinylaromatic and 0.1 to 9 parts of an olefinic C_2–C_6 nitrile.

3,933,938
GRAFTED POLYETHER DIOL-BASED THERMOPLASTIC URETHANE ELASTOMER

Richard D. Rhodes, Jr., Somersworth, and William M. Humphrey, Jr., Dover, both of N.H., assignors to McCord Corporation, Detroit, Mich.

Filed May 15, 1974, Ser. No. 469,959
Int. Cl.² C08L 27/00
U.S. Cl. 260—859 R **5 Claims**

1. An injection molding-grade thermoplastic polyurethane having good low temperature properties made by reacting the following:

	Parts by weight
Grafted polyol	100
poly alkane ether diol	2 to 70
Aromatic polyisocyanate	40 to 100
C_3–C_6 alkane diol	10 to 40

Wherein:

said grafted polyol is a **2000** to **5000** molecular weight copolymer of:

a. 70 to 90 weight percent of a 1000 to 4000 molecular weight poly (oxy C_1–C_4 alkene) diol, reacted by a free radical polymerization with

b. 10 to 30 weight percent of a monomer mixture of 1 part by weight of a vinylaromatic and 0.1 to 9 parts of an olefinic C_3–C_6 nitrile, and

said polyalkylane ether diol has a molecular weight in the range of 500 to 2500.

3,933,939
POLYESTER WITH EPOXY MONOMER, AND A CROSS-INKING MONOMER

Osamu Isozaki, and Seigo Iwase, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed June 10, 1974, Ser. No. 477,642
Claims priority, application Japan, June 13, 1973, 48-65795
Int. Cl.² C08L 67/06
U.S. Cl. 260—872 **9 Claims**

1. A liquid unsaturated resin composition which comprises (A) 60 to 95% by weight of liquid resin and (B) 5 to 40% by weight of polyvinyl monomer having high boiling point, wherein said liquid resin is produced by adding 1.5 to 2 molecules of a compound having both epoxy group and polymerizable unsaturated group to each molecule of a linear polyester of 500 to 5000 in number average molecular weight and having terminal carboxyl groups, and said linear polyester is produced by condensation of (a) 10 to 25% by weight of aromatic dibasic acid or its acid anhydride and (b) 75 to 90% by weight of aliphatic saturated compounds which consist of saturated aliphatic dibasic acid and saturated aliphatic glycol, and further 10 to 60% by weight of said aliphatic saturated compounds are alicyclic saturated dibasic acid or its acid anhydride, and wherein said polyvinyl monomer is at least one member selected from the group consisting of trimethylolpropane triacrylate, trimethylolethane trimethacrylate, ethylene glycol diacrylate, ethylene glycol dimethacrylate, 1,3 -butylene glycol diacrylate, 1,3-butylene glycol dimethacrylate, 1,6-hexanediol diacrylate and 1,6-hexanediol dimethyacrylate.

3,933,940
MERCAPTAN BLOCKED THERMOSETTING COPOLYMERS

Carl C. Anderson, Hartland, Wis., and Rostyslaw Dowbenko, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 8, 1973, Ser. No. 330,815
Int. Cl.² C08F 22/00; C08G 75/00; C08L 67/06
U.S. Cl. 260—873 **14 Claims**

1. A method which comprises the steps of:

A. esterifying a polyester resin with a hydroxyl functional mercaptan having a hydrocarbon chain containing up to about 18 carbon atoms or a carboxyl functional mercaptan having a hydrocarbon chain containing up to about 18 carbon atoms in a molar amount sufficient to block at least two polyester functional groups of said polyester resin to provide a mercapto-terminated reaction product; and

B. reacting said mercapto-terminated reaction product in the presence of molecular oxygen with one or more ethylenically-unsaturated monomers to produce a thermosetting block copolymer coating composition.

7. A method which comprises the steps of:

A. esterifying a polyol with a carboxyl functional mercaptan having a hydrocarbon chain containing up to about 18 carbon atoms to provide a mercapto-terminated reaction product; and

B. reacting said mercapto-terminated reaction product in the presence of molecular oxygen with one or more ethylenically unsaturated monomers to produce a thermosetting block copolymer coating composition.

10. A method of producing a thermosetting block copolymer coating composition which comprises the steps of:

A. esterifying polycaprolactone polyal with mercaptoacetic acid to provide a mercapto-terminated reaction product; and

B. reacting said reaction product of (A) in the presence of molecular oxygen with diacetone acrylamide, 2-hydroxyethyl acrylate, acrylic acid and methyl methacrylate to provide a block copolymer.

11. The method which comprises the steps of:

A. reacting a polyester resin or polyol with an organoalkoxysilane selected from the group consisting of alpha-acryloxyalkoxysilane and alpha-methacryloxyalkoxysilane to produce a product having at least two functional groups present for reaction with a hydroxyl functional mercaptan or a carboxyl functional mercaptan;

B. reacting said product with a hydroxyl functional mercaptan having a hydrocarbon chain containing up to about 18 carbon atoms or a carboxyl functional mercaptan having a hydrocarbon chain containing up to about 18 carbon atoms in an amount sufficient to block at least two polyester functional groups to provide a mercapto-terminated reaction product; and

C. reacting said mercapto-terminated reaction product in the presence of molecular oxygen with one or more ethylenically-unsaturated monomers to produce a thermosetting block copolymer coating composition.

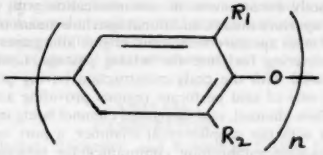
3,933,941
THERMOPLASTIC BLENDED COMPOSITION COMPRISING POLYPHENYLENE ETHER, AROMATIC POLYCARBONATE AND STYRENE RESIN

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Tokyo; Masanobu Masu, Tokyo; Masaharu Kimura, Tokyo, and Masao Okabe, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Japan

Continuation-in-part of Ser. No. 269,891, July 7, 1972, abandoned. This application May 1, 1974, Ser. No. 466,282
Claims priority, application Japan, July 9, 1971, 46-50248; United Kingdom, July 6, 1972, 31999/72; Germany, July 10, 1972, 2233896; France, July 10, 1972, 72.24957; Italy, July 8, 1972, 26813/72; Netherlands, July 7, 1972, 7209516; Belgium, July 7, 1972, 119624; Canada, July 7, 1972, 146646
Int. Cl.² C08G 39/10
U.S. Cl. 260—873 **7 Claims**

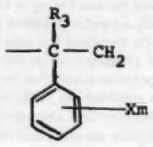
1. A thermoplastic blended resin composition comprising the following resin components:

1. 15 to 80% by weight of a polyphenylene ether having a polymer unit of the general formula



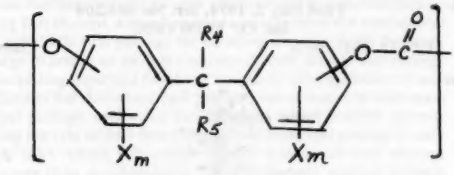
wherein R_1 and R_2 may be in the same or different and represent a methyl or ethyl group and n is a positive integer of at least 50;

2. 5 to 60% by weight of a styrene resin of at least one member selected from the group consisting of styrene homopolymers, styrene copolymers, rubber-modified polystyrenes and high impact polystyrenes and containing at least 70% of structural units of the general formula



wherein R_3 is a hydrogen atom or lower alkyl group, X is a halogen atom selected from chlorine and bromine, and m is zero or integer of 1 or 2; and

3. 2–15% by weight of an aromatic polycarbonate composed of recuring units of the general formula



wherein R_4 and R_5 may be the same or different, and represent a hydrogen atom or a lower alkyl group, and X and m are the same as defined above; the total amount of (1), (2) and (3) being 100% by weight based on the total weight of the resin.

3,933,942

PROCESS FOR GRAFT POLYMERIZATION

Joseph P. Kennedy, Akron, Ohio, and Francis P. Baldwin, Summit, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 700,324, Jan. 8, 1968, which is a continuation-in-part of Ser. No. 568,001, July 26, 1966, abandoned, which is a continuation-in-part of Ser. No. 364,295, May 1, 1964, abandoned. This application Oct. 17, 1972, Ser. No. 298,306. The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.[2] C08L *23/16*; **C08F** *255/04*, *257/02*, *259/00*

U.S. Cl. 260—878 R **23 Claims**

1. A graft polymer comprising a cationically polymerizable monomer grafted to a halogen containing polymer backbone wherein said halogen containing polymer is a substantially saturated polymer containing before grafting at least 0.01 mole % reactive halogen, said monomer being polymerized and grafted to the backbone at the original location of said reactive halogen.

3,933,943

GRAFT COPOLYMERS BASED ON METHYL METHACRYLATE POLYMERS

Gerhard Fahrbach, Schwetzingen; Erhard Seiler, Ludwigshafen, and Dieter Stein, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 24, 1973, Ser. No. 409,257

Claims priority, application Germany, Oct. 26, 1972, 2252508

Int. Cl.[2] C08L *9/06*

U.S. Cl. 260—887 **4 Claims**

1. A process for the manufacture of graft copolymers based on methyl methacrylate polymers, wherein a polymer of methyl methacrylate (A) containing at least 10% by weight of polymerized units of methyl methacrylate is reacted with a high molecular weight organic compound (B) produced by reacting at least one alkylene oxide unit having an alkali metal alcoholate end group and at least one polymer block selected from the group consisting of polydiolefin, polyvinyl aromatic and diolefin-vinyl aromatic copolymer, said reaction being carried out in an anhydrous inert organic solvent by mixing solutions of components A and B at from −50° to +100°C.

3,933,944

α,α′-BIS(PHOSPHONO)DICARBOXYLIC ACID DERIVATIVES

Jerry P. Moreau; Leon H. Chance; Gordon J. Boudreaux, all of New Orleans, and George L. Drake, Jr., Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 4, 1972, Ser. No. 311,609

Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—932 **3 Claims**

1. Dimethyl α,α′-bis(diethylphosphono)adipate.
2. α,α′-Bis(diethylphosphono)adipamide.
3. Bis(N,N′-hydroxymethyl)α,α′-bis(diethylphosphono)adipamide.

3,933,945

O-ETHYL-S-(N)-PROPYL-S-DIALLYLCARBAMOYLMETHYL DITHIOPHOSPHATE

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

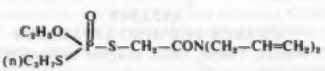
Division of Ser. No. 315,973, Dec. 18, 1972, Pat. No. 3,845,171. This application Aug. 9, 1974, Ser. No. 496,423

Claims priority, application Switzerland, Dec. 24, 1971, 18909/71; Nov. 3, 1972, 16041/72

Int. Cl. C07f *9/16*; **A01n** *9/36*

U.S. Cl. 260—943 **1 Claim**

1. The compound of the formula



3,933,946

N-HYDROXY-N-PHOSPHONOMETHYLGLYCINATES

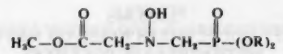
Van Russell Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1974, Ser. No. 525,269

Int. Cl.[2] C07F *9/32*; **A01N** *9/36*

U.S. Cl. 260—944 **3 Claims**

1. A compound of the formula



wherein R represents methyl or allyl.

3,933,947

O-ETHYL-S-PROPYL-S-BENZYL-PHOSPHORODITHIOLATES

Shigeo Kishino, Tokyo; Akio Kudamatsu, and Kozo Shiokawa, both of Kanagawa, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

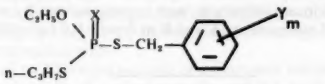
Division of Ser. No. 127,415, March 23, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,674

Claims priority, application Japan, Mar. 25, 1970, 45-24438

Int. Cl.² C07F 9/155; A01N 9/36

U.S. Cl. 260—949 **6 Claims**

1. Phosphoric acid esters of the general formula



(I)

in which

X stands for an oxygen or sulfur atom,

Y stands for lower alkyl mercapto or lower alkylsulfinyl group, and

m is 0, 1, 2 or 3.

3,933,948

DIENYLPHOSPHATES

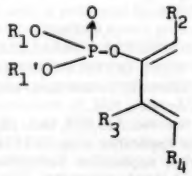
Kaspar F. Burri, West Caldwell, N.J.; Frank Kienzle, Therwill, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 15, 1974, Ser. No. 497,598

Int. Cl.² C07F 9/09; A01N 9/36

U.S. Cl. 260—957 **5 Claims**

1. A compound of the formula



wherein each of R_1 and R_1' is lower alkyl, aryl or benzyl, and each of R_2, R_3 and R_4 is hydrogen or lower alkyl.

3,933,949

CHARGE FORMING APPARATUS

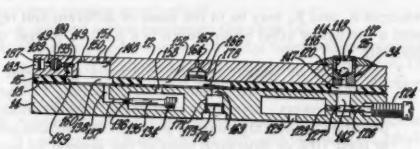
John C. Woody, Toledo, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 3, 1974, Ser. No. 466,605

Int. Cl.² F02M 17/04

U.S. Cl. 261—35 **9 Claims**

1. Charge forming apparatus for use with a two cycle internal combustion engine including a body construction provided with a fuel and air mixing passage and a fuel chamber, a fuel inlet valve, means for controlling the inlet valve, a throttle valve in the mixing passage, the mixing passage having an air induction zone and a fuel dispersion zone, the fuel dispersion zone including main aperture means for delivering fuel into the mixing passage, an engine idling aperture means for delivering fuel into the mixing passage, a supplemental chamber in said body construction in communication with the engine idling aperture means, additional aperture means independent of the main aperture means and engine idling aperture means for delivering fuel into the mixing passage, laminar means associated with the body construction having perforate regions, one of said perforate regions providing an elongated fluid flow channel, said elongated channel being in communication with the supplemental chamber, a port in said body construction establishing communication between the fuel chamber and the elongated channel accommodating flow of



fuel from the fuel chamber into the elongated channel, said additional aperture means being in communication with said elongated channel, a a pulse pressure passage means establishing communication between the crankcase of the engine and the supplemental chamber, valve means associated with said throttle valve operable when the throttle valve is moved to open position for establishing pulse pressure in said elongated channel for projecting fuel through the additional aperture means into the mixing passage, and check valve means associated with said port for preventing reverse flow of fuel from the elongated channel into the fuel chamber.

3,933,950

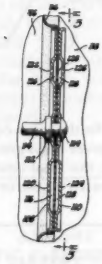
AIR VALVE CARBURETOR

Louis L. Cuttitta, Lapeer, Mich., and Walter S. Falen, Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 2, 1974, Ser. No. 466,204

Int. Cl.² F02M 19/02

U.S. Cl. 261—50 A **3 Claims**



1. A carburetor comprising a mixture conduit having an air inlet and a mixture outlet, a throttle disposed in said outlet for controlling flow therethrough, an air valve disposed in said air inlet and movable between closed and open positions, means biasing said air valve toward said closed position, a diaphragm connected to said air valve for moving said air valve toward said open position against the bias of said biasing means, one side of said diaphragm being exposed to the pressure in said air inlet upstream of said air valve, and means associated with the other side of said diaphragm for defining therewith an enclosed chamber connected to said mixture conduit between said air valve and said throttle, whereby said diaphragm and said biasing means are effective to position said air valve to establish a selected pressure differential thereacross, and wherein said diaphragm has an opening extending therethrough to permit air to flow continuously from said air inlet upstream of said air valve through said opening and said chamber to said mixture conduit downstream of said air valve

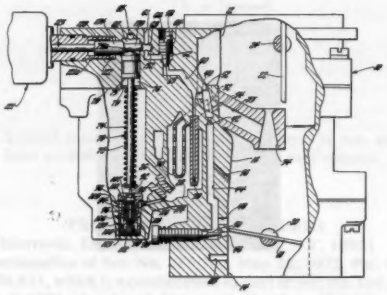
to thereby purge fuel from said chamber and inhibit accumulation of fuel in said chamber and a plate overlying said opening and having a calibrated hole restricting air flow through said opening to control the rate thereof.

3,933,951

CARBURETOR

Earl R. Fischer, Rochester, and Roland S. Taylor, Fairport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed July 1, 1974, Ser. No. 484,705
Int. Cl.² F02M *7/20*
U.S. Cl. 261—67 **1 Claim**



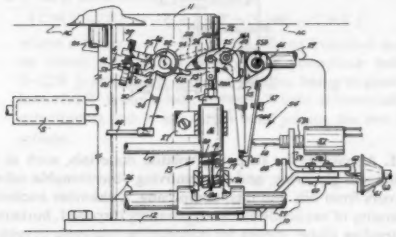
1. A carburetor comprising an air inlet for air flow to an engine, a throttle disposed in said air inlet for controlling flow therethrough, a fuel bowl, an idle fuel passage extending from said fuel bowl to said air inlet adjacent said throttle for delivering fuel thereto, a bleed passage opening from the atmosphere to said idle fuel passage for bleeding air to said idle fuel passage to create an air-fuel emulsion therein, a main fuel passage extending from said fuel bowl to said air inlet upstream of said throttle for delivering fuel thereto, valve means in said main fuel passage, said valve means having a lean position permitting the rate of fuel flow through said main fuel passage to said air inlet which will create a part throttle air-fuel mixture leaner than stoichiometric, an intermediate position permitting the rate of fuel flow through said main fuel passage to said air inlet which will create a part throttle air-fuel mixture slightly richer than stoichiometric, and a rich position permitting the rate of fuel flow through said main fuel passage to said air inlet which will create a full throttle air-fuel mixture substantially richer than stoichiometric, a pressure responsive piston for positioning said valve means, a spring biasing said piston to position said valve means in said rich position, a signal passage subjecting said piston to the pressure in said air inlet downstream of said throttle whereby said piston overcomes the bias of said spring to position said valve means in said lean position when such pressure is below a selected value and to position said valve means in said intermediate position when such pressure is above said selected value but below another value, an arm reciprocable between lean and rich modes, said arm having an actuator portion engageable with said piston when said arm is in said rich mode for causing said piston to position said valve means in said intermediate position even through the pressure in said air inlet downstream of said throttle may be below said selected value, said arm further having a valve portion receivable in said bleed passage when said arm is in said rich mode for obstructing air flow therethrough to thereby enrich the off-idle air-fuel mixture created by fuel flow through said idle fuel passage to said air inlet, and means for reciprocating said arm between said lean mode and said rich mode whereby when said arm is in said rich mode said actuator portion causes said piston to position said valve means in said intermediate position to provide a part throttle air-fuel mixture slightly richer than stoichiometric and said valve portion obstructs said bleed passage to provide an enriched off-idle air-fuel mixture, whereby when said arm is in said lean mode said actuator portion permits said piston to position said valve means in said lean position to provide a part throttle air-fuel mixture leaner than stoichiometric and said valve portion permits air flow through said bleed passage to provide a leaned off-idle air-fuel mixture, and whereby said piston may position said valve means in said rich position to provide a full throttle air-fuel mixture substantially richer than stoichiometric irrespective of the mode of said arm.

3,933,952

FUEL-AIR MIXING APPARATUS FOR VEHICLES

Gerald C. Elmore, P.O. Box 337, Lakeside, Oreg. 97449

Filed Dec. 5, 1974, Ser. No. 529,813
Int. Cl.² F02M *1/10, 31/04*
U.S. Cl. 261—145 **13 Claims**



1. A fuel-air mixing apparatus for an internal combustion engine providing for the initial mixing of fuel with an airflow with the mixture subsequently being discharged into an induction airflow whereat final mixing occurs to vaporize the fuel, said apparatus comprising,

fuel metering means including a positionable core,

air conduit means in communication with said metering means providing a heated airflow into which fuel is metered to accomplish first stage mixing, said conduit means in downstream communication at a remote point with an induction airflow to the engine,

a nozzle arrangement discharging the fuel-air mixture into the induction airflow,

fuel and air linkage including a fuel-air control lever operated by the vehicle driver via throttle linkage, fuel and air regulating components actuated by said control, said fuel regulating component operable during open throttle conditions to regulate said fuel metering means, said air regulating component associated with an induction regulation valve whereby actuation of the fuel-air control will simultaneously regulate both a metered flow of fuel into the heated airflow and the flow of induction air with second stage mixing occurring in the induction airflow,

an idle assembly regulating said fuel metering means during both idling and other closed throttle conditions, said idle assembly comprising,

an idle arm for actuation of said positionable core of the fuel metering means,

combination solenoid and vacuum responsive means acting on said idle arm to sequentially position the core for regulating fuel discharge during engine starting and the subsequent engine idling,

temperature responsive means modifying the action of said combination of said idle arm under different temperature conditions, and

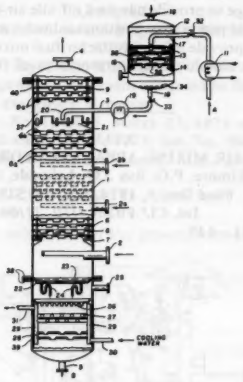
said vacuum responsive means operable under closed throttle, high intake manifold vacuum conditions occurring during vehicle deceleration to close said fuel metering means to affect fuel conservation.

3,933,953

APPARATUS FOR DEODORIZING FATS AND OILS

Max Leva, 5118 Hayes St., Hollywood, Fla. 33021

Filed June 6, 1972, Ser. No. 260,209
Int. Cl.² B01D 3/22
U.S. Cl. 261—148 9 Claims



1. Apparatus for stripping volatile materials, such as fatty acids and glycerine, and for removing objectionable odors or flavors from oils and fats, comprising, a chamber enclosing a plurality of vertically stacked, parallely disposed, horizontally extending plates, means for introducing relatively oxygen-free heated oil at the top of said plates, each plate having a plurality of apertures wherein the distance between said apertures is less than the maximum width of said apertures, chimneys extending only downwardly from the perimeters of said apertures, the top surfaces of said plates being devoid of upwardly extending projections, said apertures being devoid of obstructions, whereby thin films of heated oil are formed on said plates, means for introducing superheated steam in the lower portion of said chamber so as to rise through said chimneys and apertures counter-currently of said oil and flow over said films of heated oil to boil out fatty acids and volatile odor-forming matter, and means for evacuating said fatty acids and odor-forming matter from the upper portion of said chamber.

3,933,954

PREPARATION OF POWDERS HAVING SPHERICAL-SHAPED PARTICLES FROM IONOMER RESINS AND ETHYLENE/CARBOXYLIC ACID COPOLYMER RESINS

John Charles Gebhard, Jr., West Chester, Pa.; Marion Glen Waggoner, and James Lang Webster, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1973, Ser. No. 419,894
Int. Cl.² B01J 2/18
U.S. Cl. 264—8 23 Claims

1. A method of producing spherical-shaped copolymer particles having a surface covered with hemispherical bumps which comprises

a. shearing under pressure sufficient to keep water in the liquid state in a closed shear zone of a shear device water, ammonia and a copolymer of alpha-olefins of the formula $R—CH=CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and alpha, beta-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, said copolymer having from 0% to 90% of the carboxylic acid groups ionized by neutralization with metal ions, and said metal ions having an ionized valence of from one to three inclusive when the unsaturated acid is a monocarboxylic acid and an ionized valence of one when the unsaturated acid is a dicarboxylic acid and said metal ions being selected from the group consisting of uncomplexed and complexed metal ions, said copolymer being a direct copolymer of the alpha-olefins and unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which

1. the alpha-olefin content of the copolymer is at least 50 mol percent, based on the alpha-olefin-acid copolymer,
2. the unsaturated carboxylic acid content of the copolymer is from 0.2 to 25 mol percent, based on the alpha-olefin-acid copolymer, and
3. any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated,

at a temperature above the melting point, but below the thermal degradation point, of the copolymer until a homogeneous aqueous slurry is formed wherein the copolymer particle size has been reduced to an average particle size of less than 100 microns, the slurry containing at least 0.6% by weight ammonia as NH_3 and up to 50% by weight of said copolymer;

b. agitating the slurry under pressure at a temperature above the copolymer freezing point for at least 0.5 minute to make the copolymer particles spherical;

c. agitating while under said pressure and cooling the slurry to below the copolymer freezing point in a period of at least 0.3 minute, thereby forming on the surface of said particles hemispherical bumps about 0.1 micron in diameter;

d. reducing said pressure of said slurry to atmospheric pressure; and

e. separating the copolymer particles.

3,933,955

PROCESS FOR PRODUCING MICROSPHERES

Wayne M. Lysher, Richland, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 98,975, Dec. 17, 1970, Pat. No. 3,729,278.
This application July 26, 1972, Ser. No. 275,236
Int. Cl.² B01J 2/06
U.S. Cl. 264—9 9 Claims

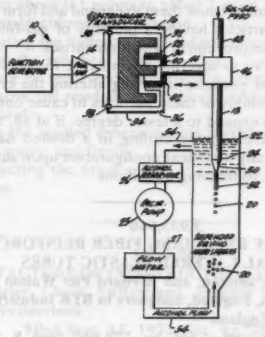
1. A process for producing microspheres, which comprises the steps of:

immersing a lower portion of a generally vertical sol-gel feed tube comprising a lower end portion including a generally vertical microsphere formation nozzle in a column of drying liquid of predetermined viscosity, said nozzle being hollow and having an open bottom end;

feeding a sol-gel solution at a predetermined rate into an upper end portion of said feed tube and axially out said bottom end of said nozzle, said drying liquid being a nonsolvent of said sol-gel; and

vibrating said nozzle at a predetermined amplitude and frequency whereby said bottom end of said nozzle is displaced over a predetermined travel in a generally horizontal direction and said sol-gel being emitted in a

generally vertical direction therefrom coacts functionally with said drying liquid in a breaking action to produce



formed microspheres which are uniform in size and at least partially dried in falling through said column.

3,933,956

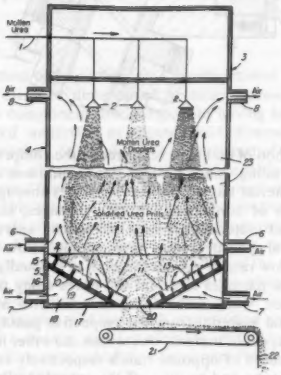
PROCESS FOR PRILLING UREA

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Continuation of Ser. No. 255,760, May 22, 1972, Pat. No. 3,836,611, which is a continuation-in-part of Ser. No. 104,998, Jan. 8, 1971, abandoned. This application June 18, 1974, Ser. No. 480,376

Int. Cl.² B01J *2/04*

U.S. Cl. 264—14 **4 Claims**



1. In a process for prilling urea, comprising:

a. spraying molten, substantially anhydrous urea downwardly as droplets in a prilling tower through a solidification zone therein generally toward the bottom of said tower;

b. contacting said droplets with a substantially inert gas passed into said zone to cool and solidify said droplets as anhydrous prills; and

c. collecting said prills at a centrally located bottom of said zone;

the improvement comprising:

d. passing said gas through a hollow, perforated, inverted frustum trough countercurrently to said downwardly falling prills and maintaining gas flow, gas velocity and the angle of said trough through which said gas is so passed as a fine dispersion, so as to divert said downwardly flowing prills from a substantially vertical path to an oblique path toward said bottom of said zone and to prevent substantially all of said prills from contacting said trough.

3,933,957

PROCESS FOR PRODUCING SHAPED ARTICLES FROM AN ACETYLENIC POLYMER

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,168

Int. Cl.² B29C *25/00;* **C08K** *5/03*

U.S. Cl. 264—29 **12 Claims**

1. The process of making a shaped object from a mixture consisting essentially of:

A. an acetylenic polymer having at least 10 repeating units which are

a. 80–95% units having the formula

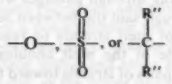
$$-C \equiv C-R-C \equiv C-,$$

and

b. 5–20% units having the formula

$$\left[C \equiv C-CH_2-O-R'-X-R'-\right]_n O-CH_2-C \equiv C-$$

where *n* is 0or 1, R is phenylene having from 0–4 halo or lower alkyl substituents, said phenylene being 0–12% p-phenylene, and the balance being m-phenylene and R′ is phenylene having 0–4 halo or lower alkyl substituents and X is a direct bond joining the two R′ groups,



where R″ is lower alkyl, and

B. a nitrobenzene, a halobenzene, òr a mixture thereof solvent having a boiling point greater than 100°C. at 760 mm., which at room temperature, is entirely

a. liquid, or

b. crystalline,

which comprises

1.heating a mixture of (A) and (B) to a temperature where the mixture forms a stable, homogeneous solution contaning at least 4% by weight of (A) and thereafter cooling the hot mixture in contact with at least one shaping surface to a temperature where the mixture congeals to a solid containig both (A) and (B), subject to the proviso that said solid have a maximum material thickness of 250 mils when (B) is crystalline at room temperature, and thereafter

2.removing the nitrobenzene, the halobenzene, or the mixture thereof contained in said solid by contacting said mixture of (A) and (B) with

C. an acetone extraction solvent which is (a) a nonsolvent for said acetylenic polymer (A), and (b) a solvent for said (B) solvent, or by sublimating said (B) solvent wherein the resulting shaped object is isotropically shrunk during said removing.

3,933,958

METHOD OF MAKING TUBULAR PLASTIC FILM

Donald R. Hinrichs, Waynesboro, Va., assignor to Reynolds Metals Company, Richmond, Va.

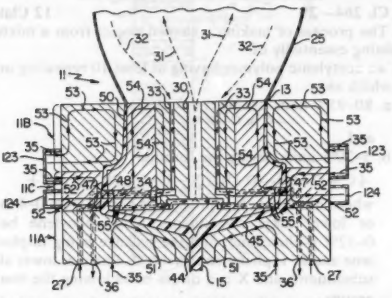
Division of Ser. No. 126,831, March 22, 1971, Pat. No. 3,752,635. This application July 12, 1973, Ser. No. 378,531. The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.

Int. Cl.² B29D *23/04;* **B29F** *3/08*

U.S. Cl. 264—40 **7 Claims**

7. A method of making polyvinyl chloride film comprising the steps of, feeding a plastic melt under pressure to an inlet of an extrusion die having a central longitudinal axis, dividing the melt using parallel bores in said die into a plurality of

spaced melt strands arranged parallel to said axis and thereafter recombining it at the outlets of said bores in a single combining chamber to form an annulus of plastic melt concentrically around said axis, extruding the melt annulus through a die orifice to define a plastic tube, closing said tube at a position spaced from said outlet, supplying a gas through said die into said tube causing inflation thereof to form a plastic bubble which is used to define said film, and heating and continuously feeding a heat transfer fluid through the die and circulating part of the fluid adjacent the outside of the melt annulus and part of the fluid adjacent the inside of the melt annulus



with that part of the fluid circulating adjacent the inside of the melt annulus passing through passages which extend substantially radially through said die between several adjacent pairs of said plurality of melt strands to reach and return from adjacent the inside of the melt annulus, said fluid passing between adjacent pairs of strands toward the inside of the melt annulus passing on at least one side of each of said strands, said fluid passing through said substantially radially extending passages serving to control the temperature of said die between said strands to thereby control the temperature and flow of the melt defining said strands.

3,933,959

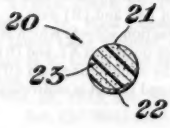
PREPARATION OF DUNNAGE MATERIAL

Richard E. Skochdopole, and Keith R. Denslow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 95,705, Dec. 7, 1970, abandoned, which is a division of Ser. No. 732,270, May 27, 1968, Pat. No. 3,723,240. This application Sept. 5, 1972, Ser. No. 286,305

Int. Cl.[2] B29D *27/00*; **B65D** *65/44*

U.S. Cl. 264—45.5 **6 Claims**



1. A method for the preparation of foamed dunnage in the form of particles, the method comprising

providing a heat plastified mass of synthetic resinous material containing an expanding agent, the heat plastified mass being capable of expansion to form a mass containing a plurality of closed gas-filled cells,

maintaining the heat plastified foamable material under pressure, subsequently

cooling the heat plastified mass below the foaming temperature thereof, to provide a cooled heat plastified mass

extruding the cooled heat plastified mass to form elongate strands, the mass being extruded from a shaping configuration without significant foaming occurring in the strands, subsequently

severing the strands to form a plurality of elongate elements of relatively high bulk density

the elongate elements being heatable to an elevated temperature sufficient to cause them to expand and form foamed strandular particles having a plurality of gas-filled cells therein, the improvement which comprises

introducing, prior to severing, asymmetric foamability into the strandular particles involving altering the cross-sectional expansibility of these particles to cause one side of the strand to expand to a lesser degree, if at all, than the other, to thereby cause curling to a desired degree to form a generally nonlinear configuration upon subjecting the elements to foaming conditions.

3,933,960

METHOD OF EXTRUDING FIBER REINFORCED PLURAL LAYERED PLASTIC TUBES

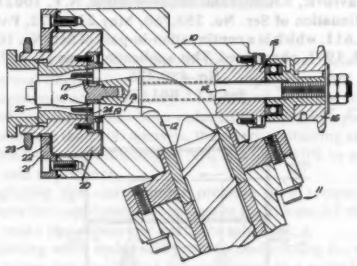
James Brisbane Cameron, and Bernard Piet Walton Knight, both of London, England, assignors to BTR Industries Limited, London, England

Continuation-in-part of Ser. No. 178,610, Sept. 8, 1971, abandoned. This application Nov. 30, 1973, Ser. No. 420,637

Claims priority, application United Kingdom, Sept. 11, 1970, 43611/70

Int. Cl.[2] B29D *23/04*

U.S. Cl. 264—108 **15 Claims**



1. A method of making a reinforced tube comprising continuously extruding under laminar flow conditions at least one viscous material having reinforcing fibres through two concentric sets of converging discrete passages, said passages dividing said material flow into two spaced apart concentric sets of plural spaced streams having a lineal flow and causing the lineal flow rate of viscous material to gradually increase as it enters the passages to orient the fibres along the length of the passages, while maintaining laminar flow and bringing together said material from the respective passages so as to form two layers of material one within the other having fibres lying on helices of opposite hands respectively extruding the layers as a tube and hauling-off the extruded tube through a resizing die at a regulated rate to control the angle of the helices on which the fibres lie, and allowing said layers to consolidate into a single tube.

3,933,961

TABLETTING SPHERICAL DENTAL AMALGAM ALLOY

Charles Francis Burns, Lansdowne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 13, 1974, Ser. No. 532,438

Int. Cl.[2] B22F *1/02*, *3/02*

U.S. Cl. 264—111 **7 Claims**

1. The process for treating spherical alloy particles to enable them to be tabletted in a compacting press comprising:

contacting spherical dental amalgam alloy particles with a hydrochloric acid solution of cupric chloride for a time sufficient to react with the alloy surface and grow cubical crystals containing copper thereon said hydrochloric acid

ranging in concentration from about 10 volume percent to about 30 volume percent concentrated hydro chloric acid and said cupric chloride ranging in concentration from about 0.1 grams to about 1 gram per 100 milliliters of hydrochloric acid solution;

separating the hydrochloric acid solution of cupric chloride from the spherical alloy particles;

washing the separated spherical alloy particles with water to remove the residual hydrochloric acid solution of cupric chloride;

drying the washed spherical alloy particles to remove residual water; and finally

compacting the dried spherical alloy particles into a solid form.

3,933,962
MANUFACTURE OF CONSTRUCTIONAL COMPONENTS

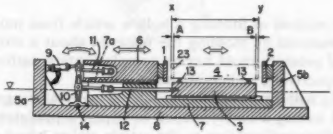
Peter Meier, Cham, Switzerland, assignor to Credelca A.G., Zug, Switzerland

Filed Sept. 11, 1972, Ser. No. 287,644

Claims priority, application United Kingdom, Sept. 14, 1971, 42701/71; Apr. 4, 1972, 15301/72

Int. Cl.² B32B *31/121;* **B28B** *3/10*

U.S. Cl. 264—134 **2 Claims**



1. A method of imparting, to a constructional component for a room element, dimensional accuracy between opposed faces of the component, the component having been initially manufactured undersize as regards said dimension, which method comprises, (a) applying to at least part of both of said opposed faces, a layer of settable material capable of adhering to said opposed faces, (b) disposing the component with the applied settable material between opposed abutments, two of said abutments constituting reference surfaces, with the settable material disposed between each reference surface and a different adjacent one of the opposed faces of the component, (c) effecting relative approach between the abutments so as to squeeze and reduce in thickness the layers of settable material, (d) terminating said approach at a position giving desired dimensional accuracy, and (e) allowing or causing the material to set before removal of the component from between the opposed abutments.

3,933,963
SPINNING PROCESS

John Clark Norman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1974, Ser. No. 532,610

Int. Cl.² D01F *6/00*

U.S. Cl. 264—170 **2 Claims**

1. In the spinning of an anisotropic spin dope of poly(p-phenylene terephthalamide) in concentrated sulfuric acid wherein the spin dope is passed through a filter and a spinneret pack and extruded, the improvement comprising using a polymer having an inherent viscosity of at least 3 and containing at least 90 −[10 (I.V.)] meq. of amine end groups per kg. of polymer, wherein (I.V.) is the inherent viscosity of the polymer whereby filter and spinneret pack life is extended.

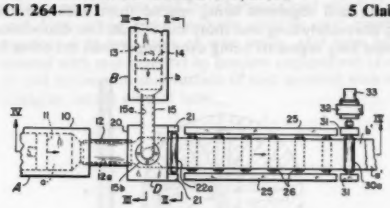
3,933,964
RESIN LAMINATE AND METHOD OF MAKING

Bernard W. Brooks, R.D. No. 3, Great Barrington, Mass. 02138

Filed Apr. 26, 1971, Ser. No. 137,342

Int. Cl.² B32B *27/30, 27/08*

U.S. Cl. 264—171 **5 Claims**



1. A process of the character shown and described for forming an improved extrudate resin laminate for glazing utilizations that is relatively unbreakable, that has the property of toughness and visual clearness and of light transmission without adverse reaction to ultraviolet light, and that is capable of being shaped, formed and used without danger of separating its layers with respect to each other which comprises, pressure-energizing and advancing a continuous flowing stream of acrylic resin in a molten condition as a strip-like section within and along an extrusion flow path within a die, simultaneously pressure-energizing and advancing a continuous flowing stream of a polycarbonate resin in a fully molten condition as a strip-like section of greater thickness than the acrylic strip-like section within and along a second extrusion flow path within the die; as the resins issue from the first and second-mentioned flow paths and without exposing them to the atmosphere, applying the acrylic resin as a strip-like flat face layer of lesser thickness upon the polycarbonate resin as a strip-like flat base layer of greater thickness within a final extrusion flow path within the die, pressure-energizing and advancing the two molten resin streams in wide face abutment with respect to each other within and along the final extrusion flow path to outwardly exit from the die as an extruded layered flow stream, and substantially immediately adjacent the exit of the layered stream from the die subjecting it to cooling and solidification and forming a molecularly bonded-together composite strip-like member; in furtherance of the process, advancing the polycarbonate resin material as a centrally disposed streamlike base layer; advancing the acrylic resin material in the form of two streamlike layers of strip-like section, each of lesser thickness than the polycarbonate strip-like section within the die and applying them in an aligned abutting relation to opposite faces of the base layer; and forming a composite resin member length having a base layer of the polycarbonate resin material and opposed facing layers of the acrylic resin material.

3,933,965
PROCESS FOR THE MANUFACTURE OF RODS OF THERMOPLASTIC MATERIAL, HAVING INTERNAL CAPILLARY DUCTS, FOR THE PREPARATION OF PEN NIBS INCORPORATING CAPILLARY INK DUCTS

Ermenegildo Gallone, and Francesco Mazzier, Settimo Torinese, both of Italy, assignors to Global Control Corporation, Luxemburg

Filed May 13, 1974, Ser. No. 469,682

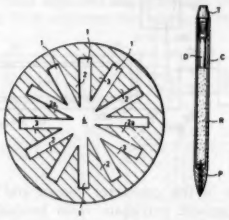
Claims priority, application Italy, May 11, 1973, 68354/73; Oct. 30, 1973, 70200/73

Int. Cl.² B28B *21/52;* **B43K** *8/02;* **D01D** *5/12*

U.S. Cl. 264—177 F **7 Claims**

1. A process for manufacturing a pen nib with capillary ink passages which is capable of providing a fine script without vibration, comprising heating a mass of thermoplastic material to a temperature higher than that at which it fuses, extruding

from said mass of thermoplastic material a rod through a die so shaped as to form inside the rod a longitudinal opening of star-shaped cross section characterized by a plurality of substantially parallel sided ducts that communicate with each other at the center of said cross section, said ducts being separated by wedge-shaped segments of said thermoplastic material, said segments being spaced from each other and being alternately long and short and at least two diametrically opposed long segments being even longer than the other long



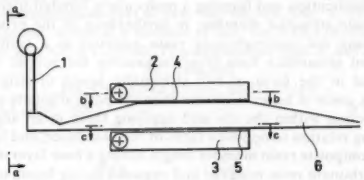
segments, said variations in segment length resulting in the disposition of the inner points of said segments at different distances from the center of said rod, cooling the extruded rod to a temperature lower than at which the thermoplastic material fuses, and mechanically drawing the cooled rod to reduce its outside diameter and also to reduce the width of said channels until said channels have a wedge-like shape tapering toward the central axis of the rod and at least said two segments contact each other.

3,933,966

METHOD AND DEVICE FOR SPRAYING FLUID INTO A HEADBOX

Veikko Kaarlo Tapio Waris, Kotka, and Frey Viking Sundman, Karhula, both of Finland, assignors to A. Ahlstrom Osakeyhtio, Finland

Continuation-in-part of Ser. No. 369,853, June 14, 1973, abandoned. This application May 13, 1974, Ser. No. 469,058
Int. Cl.² D21F *1/08, 1/66*
U.S. Cl. 162—183 **15 Claims**



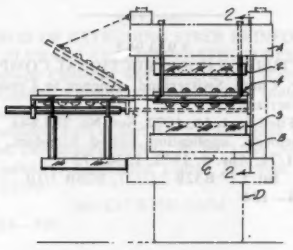
1. A method of feeding fiber suspension to the web-forming part of a paper machine while avoiding flocculation and avoiding the use of rollers, which comprises (1) feeding a thick suspension of fibers to a head box, (2) spraying a fluid which is at least one of water and steam into said thick suspension in order to dilute the same to the desired thickness before feeding it to the web-forming part and create turbulence therein to mix the suspension and thereby disperse fiber clusters, the supply box for spraying said fluid being mounted immediately adjacent to the head box wall and being separated from the inner part of the center portion of the head box by a perforated plate, the turbulence being of such intensity in the head box to disperse the fiber clusters, (3) then allowing the suspension to settle, under a turbulence of small intensity, in the lip part of the head box whereby said suspension is fed essentially free from the large scale turbulence to the web-forming part, said lip part being of sufficient length to reduce the turbulence of the suspension and (4) distributing the fiber suspension into a flow extending over the entire width of the web-forming part.

3,933,967

METHOD OF MAKING SEAMLESS HOLLOW MOLDED ARTICLES

Don A. Taylor, 216 Mill St., Wadsworth, Ohio 44281

Continuation-in-part of Ser. No. 333,872, Feb. 20, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,529
Int. Cl.² B29H *7/02*
U.S. Cl. 264—248 **7 Claims**



1. The method of forming a hollow article from moldable settable material by molding the material about a core in a segmental pressure mold having complementary parting surfaces, respectively, and comprising:

charging with unset settable moldable material a segmental mold having a cavity shaped to impart a predetermined exterior configuration to the article and in which cavity a removable core having a shape to impart a predetermined interior configuration to the article is supported, said core having a portion disposed between at least a portion of said parting surfaces and shaped to impart to at least part of the article at its periphery, aligned spaced mateable edges, respectively, from between which the core can be withdrawn from the article when mold pressure is relieved and the mold is opened sufficiently, and at least one of which edges, at each aligned unit of the length of said edges, is disposed beyond the adjacent complementary parting surfaces of the mold segments themselves, after removal of the core, a distance sufficient so that after removal of the core, the spaced mateable edges will be juxtaposed in face to face relation under pressure by movement of the mold segments to fully closed positions;

confining and molding the material by the mold segments and core under predetermined molding pressure in the space between the walls of the cavity and core;

subjecting the confined material, except for a small edge forming portion, which edge portion begins at the mateable faces of said edges and continues therefrom for a slight depth, to a predetermined temperature required for effecting the setting reaction of the material, continuously until the reaction has proceeded to a high degree which is beyond the scorch stage of the material and is sufficient to create a skin over the molding surfaces and impart structural and dimensional stability thereto;

concurrently maintaining said edge forming portion of the material at a lesser temperature so as to initiate the setting reaction thereof and carry said setting reaction to a lesser degree, which lesser degree is below the skin forming stage so that the mateable edges are free from skin effect, are firm enough to transmit substantial pressure upon closure of the mold, and are fusible and bondable;

then opening the mold and immediately removing the core therefrom, and immediately reclosing the mold under molding pressure;

immediately after reclosure of the mold, subjecting all of said material, including said edge forming portion, to said predetermined temperature;

continuing the application of heat until the setting reaction of all of the material is carried to completion; and

then opening the mold and removing the molded material from the mold.

3,933,968

METHOD OF MOULDING ARTICLES FROM A PASTE LIKE MATERIAL

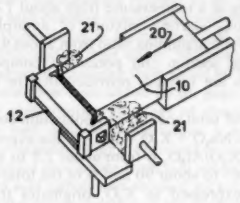
Pierre Sorbier, Rue de Brancas, Pernes-les-Fontaines, France

Continuation of Ser. No. 204,660, Dec. 3, 1971, abandoned, which is a division of Ser. No. 794,631, Jan. 28, 1969, Pat. No. 3,664,797. This application Jan. 14, 1974, Ser. No. 433,415

Claims priority, application France, Jan. 29, 1968, 68.49590; July 29, 1968, 68.50254

Int. Cl.² B29J *5/04*

U.S. Cl. 264—297 **1 Claim**



1. A method of moulding an article from a paste-like substance comprising the steps of:

a. automatically placing an insert in an open end of a moulding tunnel so as to close the end of said tunnel,

b. locking said insert in its closing position,

c. delivering a charge of material into said moulding tunnel,

d. advancing a first part of a composite piston toward said insert to compress the material between said first part of said piston and said insert to perform a first moulding operation,

e. advancing a plurality of additional pistons into said moulding tunnel adjacent said insert in directions normal to the direction of movement of said composite piston so as to compress the material disposed between said composite piston and said additional pistons,

f. advancing a second part of the composite piston toward said insert to compress the material between said second part of said piston and said insert to perform a second moulding operation,

g. unlocking said insert,

h. pushing the moulded article and insert into a curing tunnel by further advancement of said composite piston,

i. automatically separating said moulded article from said insert after traversing said curing tunnel, and

j. automatically returning said insert to said moulding tunnel.

3,933,969

HOLLOW REINFORCED CONCRETE FENCE POST AND METHOD AND APPARATUS FOR MAKING THE SAME

Frank R. Robinson, and Frank S. Robinson, both of Rte. 2, Box 336, Dallas, Oreg. 97338

Filed Apr. 15, 1974, Ser. No. 460,759

Int. Cl.² B28B *1/20*

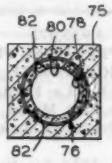
U.S. Cl. 264—312 **1 Claim**

1. A method of making wire reinforced hollow concrete fence posts, comprising

placing a mandrel in an elongated horizontally positioned form having the general external shape of a fence post to be made;

placing a cylindrical tube of wire mesh over said mandrel and supporting said tube remote from the surface of said mandrel on spacers attached longitudinally to said surface of said mandrel, said tube being formed with means for engaging said spacers on said surface of said mandrel upon rotation thereof;

injecting concrete into said form between said mandrel and said form while simultaneously rotating said mandrel together with said tube of wire mesh, said tube being rotated with said mandrel by positive engagement of one of said spacers on said surface of said mandrel with said engaging means on said tube,



said form remaining stationary, to cause said concrete thoroughly to fill the interstices in said mesh, said injecting and said rotating continuing until the space between said mandrel and said form is filled with said concrete;

longitudinally withdrawing said mandrel from said form while retaining said concrete and said tube of wire mesh within said form; and

pushing said concrete and said tube of wire mesh longitudinally out of said form onto a receiving means, said mesh supporting said concrete until the same has set.

3,933,970

SHAPED PRESS-FORGED NORMALLY FRANGIBLE INORGANIC CRYSTALS

King H. Rosette, Chagrin Falls, and Herbert Packer, Cleveland Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Nov. 20, 1972, Ser. No. 307,939

Int. Cl.² B29D *11/00*

U.S. Cl. 264—320 **2 Claims**

1. A process for press-forging a melt-grown ingot of an ionic salt selected from an alkali metal halide and an alkaline earth metal halide comprising maintaining said ingot at a temperature below its melting point, but greater than one-half its melting point measured in degrees Centigrade, gradually pressing said ingot at said temperature between opposed spaced-apart surfaces exerting sufficient pressure to move one surface closer to the other to provide a deformation ratio of at least 1.5, maintaining the physical and optical integrity of said ingot, effecting a general deformation of said ingot regardless of the theoretical number of individual slip systems characteristic of its lattice structure or the orientation of said ingot between said surfaces, and simultaneously effecting transformation of the essentially monocrystalline ingot to a polycrystalline form.

3,933,971

MOLYBDENUM RECOVERY

Everett Ira Baucom, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 436,949, Jan. 28, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,851

Int. Cl.² C01G *39/00*

U.S. Cl. 423—54 **10 Claims**

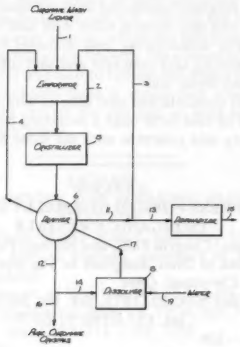
1. A process for the recovery of metal values from acidic aqueous solutions comprising ions of molybdenum, iron and sulfate and wherein nitrate is less than one gram per liter of solution comprising (a) contacting said aqueous solution with an extractant consisting essentially of a substantially water-insoluble liquid hydrocarbon having at least 0.15 moles per

liter of hydrocarbon of an alkyl amine dissolved therein while maintaining said aqueous solution at a pH of less than about 1.3 to selectively extract molybdenum and sulfate ions into the organic phase and thereafter separating the aqueous phase from the organic phase, (b) contacting the organic phase from step (a) with an aqueous solution maintained at a pH in the range of about 1.3 to about 4.5 to selectively strip sulfate ions from the organic phase and thereafter separating the aqueous phase from the organic phase, (c) contacting the organic phase from step (b) with an aqueous solution maintained at a pH of at least about 4.5 to strip the molybdenum values from said organic phase.

3,933,972
PROCESS FOR PREPARING PURE SODIUM BICHROMATE

Robert Bauwens, Saint-Leu-La Foret; Robert Lefrancois, Paris, both of France, and Michel Gabriel, Casablanca, Morocco, assignors to Products Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 11, 1974, Ser. No. 441,652
Int. Cl.² C01G 37/14
U.S. Cl. 423—57 **10 Claims**



1. A process for preparing sodium bichromate substantially free of vanadium and chlorine which comprises concentrating a sodium chromate liquor obtained from chrome-bearing minerals to form crystals of sodium chromate tetrahydrate, separating the tetrahydrate crystals from the liquor and recovering the crystals, treating the separated crystals with sulfuric acid to form the bichromate and recovering the sodium bichromate after separation of insoluble sodium sulfate formed.

3,933,973
TREATMENT OF LEAD SULPHIDE BEARING MATERIAL

David John Ivor Evans, North Edmonton, and Ian M. Masters, Edmonton, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Oct. 16, 1973, Ser. No. 406,979
Int. Cl.² C01G 21/14; C22B 13/04
U.S. Cl. 423—93 **11 Claims**

11. A method of treating finely divided material containing predominantly lead sulphide which comprises the steps of: dispersing said material in an aqueous medium to formm a first slurry; providing in said first slurry free acetate ions; reacting said first slurry at a temperature of between about 60°C. and about 120°C. with a free oxygen-bearing gas under a partial pressure of oxygen of between about 20 and 60 p.s.i.; continuing said reaction to oxidize said lead sulphide and to convert it to soluble lead acetate with concurrent production of insoluble elemental sulphur; separating solids from solution containing soluble lead acetate; adjusting the pH of said first slurry during said reaction and up to said separation step to below about 5.1; forming a second slurry of said solids in an aqueous ammoniacal solution in the presence of a free oxygen-bearing gas and adjusting the molar ratio of ammonia to any lead sulphate in said second slurry to between about 8 to about 10 to convert any lead values contained in said solids to lead sulphides; thence separating undissolved residue from said second slurry and recycling said undissolved residue to said first slurry.

3,933,974
PROCESS FOR THE PREPARATION OF FERRIERITE

Bruce H. C. Winquist, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 18, 1975, Ser. No. 550,307
Int. Cl.² C01B 33/28
U.S. Cl. 423—118 **10 Claims**

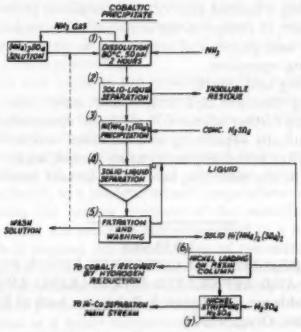
1. A method for the preparation of ferrierite which comprises maintaining at a temperature from about 170° to about 215°C an aqueous starting mixture of amorphous silica-alumina having a silica/alumina ratio from about 9 to about 25 and a mixture of sodium and potassium compounds until ferrierite crystals are formed, provided that in the starting mixture:

a. the amount of total sodium and potassium concentration expressed as $Na_2O + K_2O = X_2O$, when expressed as the molar ratio X_2O/Al_2O_3 is from about 2.5 to about 7.5;
b. from about 65 to about 90 mol % of the total sodium and potassium, expressed as X_2O, originates from sodium and/or potassium salts of polybasic acids having a pK value greater than 10° at 18°C for the highest dissociation step;
c. the potassium ion fraction is from about 0.1 to about 0.45; and
d. the molar ratio H_2O/Al_2O_3 is from about 225 to about 315.

3,933,975
NICKEL-COBALT SEPARATION

Cvetko B. Nikolic; Weldon P. Zundel, both of Golden, and Robert S. Rickard, Lakewood, all of Colo., assignors to Amax Inc., New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 441,179
Int. Cl.² C01G 53/06, 51/00
U.S. Cl. 423—139 **4 Claims**



1. A method of separating nickel and cobalt from a mainstream nickel-cobalt solution containing nickelous and cobaltous ions, which comprises,

providing a mainstream nickel-cobalt solution in which the nickel-to-cobalt ratio ranges from about 5:1 to about 200:1,

removing an aliquot portion of said nickel-cobalt solution from said mainstream,

said aliquot portion containing enough nickel which when oxidized to the nickelic state is at least sufficient to oxidize subsequently the cobalt in the mainstream solution to the cobaltic state,

precipitating said nickel from said aliquot portion as a nickelous precipitate by the addition of a precipitating agent selected from the group consisting of a mixture of CO_2 and NH_3, and NH_3 alone, the temperature of precipitation with NH_3 alone used being over 50°C,

oxidizing said nickelous precipitate to the nickelic state,

separating said oxidized nickel precipitate from solution,

contacting the mainstream solution with said oxidized precipitate for a time sufficient to oxidize cobaltous ions in said solution to the cobaltic state and thus precipitate the cobalt from solution and reduce the nickelic ion to the nickelous state, the temperature of oxidation being over 50°C, the cobaltic precipitate also containing nickel,

and whereby the nickel in the mainstream solution is enriched substantially relative to the cobalt content,

dissolving said cobaltic precipitate in an ammonium sulfate solution containing at least about 100 grams per liter of $(NH_4)_2SO_4$ and at least about 50 grams per liter of NH_3 at a temperature ranging from about 80°C to 120°C under a pressure of at least about 20 psi gage,

acidifying said solution to a pH of about 1.5 to 3.0 and cooling said solution to produce a nickel-ammonium sulfate precipitate highly enriched in nickel,

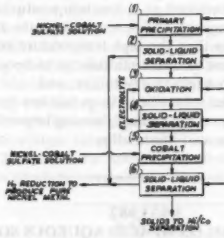
separating said precipitate from said solution which solution contains said cobalt and residual nickel,

passing said solution through an ion exchange column selective to the removal of said residual nickel, thereby leaving a solution containing said cobalt substantially free of nickel, and then passing said solution to cobalt recovery.

3,933,976
NICKEL-COBALT SEPARATION

Cvetko B. Nikolic, Golden; Robert S. Rickard, Lakewood, and Weldon P. Zundel, Golden, all of Colo., assignors to Amax Inc., New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 441,180
Int. Cl.² C01G 51/00, 53/00
U.S. Cl. 423—144 **2 Claims**



1. A method of producing a nickel-rich solution from nickel-cobalt solutions containing nickelous and cobaltous ions which comprises,

providing a mainstream nickel-cobalt solution in which the nickel-to-cobalt ratio ranges from about 5:1 to about 200:1, removing an aliquot portion of said nickel-cobalt solution from said mainstream,

said aliquot portion containing enough nickel which when oxidized to the nickelic state is at least sufficient to oxidize subsequently the cobalt in the mainstream to the cobaltic state,

precipitating said nickel from said aliquot portion as a nickelous precipitate by adding NH_3 sufficient to provide in the solution an NH_3/Ni mol ratio of about 1.5:1 to 2.5:1 with the pH ranging from about 7 to 7.5 and by bubbling CO_2 through the solution to produce an easily filterable nickelous carbonate precipitate containing cobalt,

oxidizing said nickelous precipitate to the nickelic state,

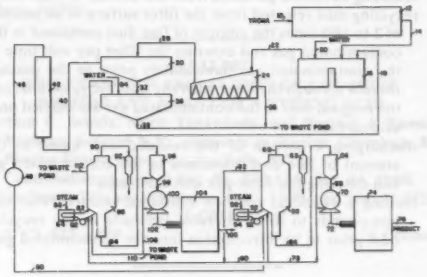
separating said oxidized nickel precipitate from solution,

and contacting the mainstream solution with said oxidized precipitate for a time sufficient to oxidize cobaltous ions in said solution to the cobaltic state and thus precipitate the cobalt from solution and reduce the nickelic ion to the nickelous state, the temperature of oxidation being over 15°C, whereby the nickel in the mainstream solution is enriched substantially relative to the cobalt to provide a nickel:cobalt ratio in said solution of over **2000:1.**

3,933,977
PROCESS FOR PRODUCING SODIUM CARBONATE

Joseph M. Ilardi, Kendall Park; John Walden, Hightstown, and Eric Rau, Trenton, all of N.J., assignors to Intermountain Research and Development Corporation, Greenriver, Wyo.

Filed Jan. 11, 1974, Ser. No. 432,467
Int. Cl.² C01D 7/12, 7/24, 7/40
U.S. Cl. 423—206 T **7 Claims**



1. In the process of producing high bulk density sodium carbonate from crude trona, crude trona is calcined at a temperature and for a time sufficient to convert the crude trona into crude sodium carbonate, the crude sodium carbonate is dissolved in water to form an aqueous solution of crude sodium carbonate containing suspended insolubles and soluble organic impurities, the coarse suspended insolubles are separated from the crude sodium carbonate solution, the crude sodium carbonate solution is clarified and treated to remove a substantial portion of the remaining suspended insolubles and soluble organic impurities from the crude sodium carbonate solution, a portion of water from the clarified sodium carbonate solution is evaporated in a monhydrate crystallizer and sodium carbonate monohydrate crystals are formed, the sodium carbonate monohydrate crystals are then separated from the monohydrate crystallizer liquuor containing organic impurities, and the separated sodium carbonate monohydrate crystals are calcined to form dense sodium carbonate and 0 percent to 100 percent of the separated monohydrate crystallizer liquor containing organic impurities is recycled to the monohydrate crystallizer for further monohydrate crystal recovery therefrom, wherein the improvement comprises: bleeding a portion of the monohydrate crystallizer liquor to maintain the concentration of the organic impurities in the monohydrate crystallizer below about 300 ppm carbon based on the sodium carbonate solution present in the monohydrate crystallizer, evaporating a portion of the bleed liquor at a temperature above about 109°C in an anhydrous crystallizer and crystallizing anhydrous sodium carbonate crystals, purging a portion of the anhydrous crystallizer liquor to maintain the concentration of the organic impurities in the anhydrous crystallizer below 4,000 ppm carbon based on the sodium carbonate solution present in the anhydrous crystallizer, separating the anhydrous sodium carbonate crystals from the

anhydrous crystallizer liquor, and drying the separated anhydrous sodium carbonate crystals to form high bulk density sodium carbonate.

3,933,978

METHOD OF FILTERING DUST-LADEN GASES

Adolf Margraf, Im Haberkamp 196, 4961 Wendthagen, Germany

Continuation-in-part of Ser. No. 230,721, March 1, 1972, Pat. No. 3,834,123. This application Mar. 22, 1973, Ser. No. 343,803

Claims priority, application Germany, Mar. 28, 1972, 2215065. The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl.² B01D *53/34*

U.S. Cl. 423—215.5 **5 Claims**

1. A method of filtering a contaminated gas containing fine dust particles and sulphur or chlorine compounds which comprises the steps of:

feeding the contaminated gas to a pocket-type filter and through the filter;

collecting particles from said contaminated gas on said filter;

releasing collected particles from the surface of said filter;

recycling dust released from the filter surface in an amount of 2 to 100 times the amount of fine dust contained in the contaminated gas and entering the filter per unit time to the contaminated gas immediately prior to the passage thereof through the filter whereby both recycled dust and the original dust in the contaminated gas are carried onto said surface;

discharging a portion of the released dust equal to the amount of fine dust contained in the contaminated gas and entering the filter per unit time; and

feeding a chemical additive substance reactive with said compounds to form filterable products to the recycled dust prior to its introduction into the contaminated gas.

3,933,979

GAS PURIFYING METHOD

Karl-Heinz Eisenlohr, Buchschlag; Berthold Scholz, Weisskirchen, and Ernest Kapp, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 23, 1973, Ser. No. 390,826

Claims priority, application Germany, Sept. 22, 1972, 2246722

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **8 Claims**

1. A method for purifying hydrogen-containing gases which also contain nitrogen oxides to remove the nitrogen oxides from such gas which comprises adjusting the sulfur content of the hydrogen containing gas to 0.05 to 8 g/Nm³ or more by adding sulfur or sulfur compounds thereto and passing this adjusted gas over a hydrogenation catalyst at a temperature between 100° and 400°C.

3,933,980

PROCESS FOR REMOVING ETHYLENICALLY UNSATURATED CHLORINATED HYDROCARBONS FROM GAS STREAMS

Lawrence A. Smalheiser, Spring Valley, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 19, 1974, Ser. No. 534,522

Int. Cl.² B01D *53/34*

U.S. Cl. 423—245 **12 Claims**

1. A method for controlling the amount of ethylenically unsaturated chlorinated hydrocarbons in gas streams which comprises forming a gas mixture containing the ethylenically unsaturated chlorinated hydrocarbon and ozone in a reaction zone and maintaining the gas mixture in the reaction zone for a sufficient length of time for the ozone to react with the ethylenically unsaturated chlorinated hydrocarbon to reduce the amount of ethylenically unsaturated chlorinated hydrocarbon in the gas stream.

3,933,981

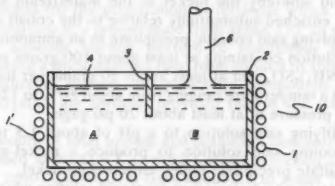
TIN-LEAD PURIFICATION OF SILICON

Gene Felix Wakefield, Richardson, and H. S. Nagaraja Setty, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1973, Ser. No. 420,484

Int. Cl.² C01B *33/02*

U.S. Cl. 423—348 **2 Claims**



1. The method of purifying silicon in a refiner containing liquid tin-lead alloy at varying temperatures, comprising the steps of:

a. introducing impure solid silicon into a molten tin-lead alloy, said alloy having a composition ranging between 80% tin - 20% lead and 50% tin-50% lead, and said impure silicon being introduced into a first compartment of said refiner, the temperature of said first compartment being sufficiently high to cause the silicon to go into solution with said alloy;

b. circulating said solution of liquid alloy and silicon from said high temperature zone into a second compartment of said refiner maintained at a low temperature zone, the temperature range of said low temperature zone being sufficiently lower than the high temperature zone of said first compartment to cause said silicon to become supersaturated and to begin to crystallize; and

c. removing purified solid silicon from said low-temperature zone as said silicon crystallizes, leaving impurities of said silicon behind in said liquid alloy.

3,933,982

METHOD OF STABILIZING ACID AQUEOUS SOLUTIONS OF HYDROGEN PEROXIDE

Kazuyoshi Kushibe, Fuji, Japan, assignor to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1973, Ser. No. 419,028

Claims priority, application Japan, Feb. 21, 1973, 48-20194

Int. Cl.² C01B *15/02*

U.S. Cl. 423—272 **11 Claims**

1. In the method of stabilizing hydrogen peroxide in an acid aqueous solution of hydrogen peroxide containing copper ion capable of catalytically decomposing hydrogen peroxide by incorporating a stabilizer to said aqueous solution, the improvement which comprises using as the stabilizer at least one glycol ether represented by the general formula $R(OCH_2CH_2)_n$—OH wherein R is an alkyl group containing 1 to 4 carbon atoms and n is an integer from 1 to 2.

3,933,983

METHOD OF INCREASING THE THERMAL STABILITY OF CRYSTALLINE ZEOLITES

Curtis H. Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 150,780, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 803,117, Feb. 27, 1969, Pat. No. 3,594,331. This application Nov. 12, 1973, Ser. No. 415,861. The portion of the term of this patent subsequent to July 20, 1988, has been disclaimed.

Int. Cl.² C01B *33/28*

U.S. Cl. 423—328 **15 Claims**

1. A method of producing highly stable fluorided crystalline aluminosilicate zeolites comprising:

a. contacting at least once a crystalline aluminosilicate zeolite in the alkali metal form with a sufficient quantity of a solution of a soluble fluorine compound which in solution yields available fluoride ions to provide from about 2 to 22 grams of available fluoride per 10,000 grams (dry basis) of zeolite, and a slurry pH of about 3 to 11 for a sufficient length of time to allow said solution to thoroughly contact and diffuse into said zeolite;

b. separating and washing the fluoride treated crystalline aluminosilicate zeolite;

c. exchanging the alkali ions in said fluoride treated crystalline aluminosilicate zeolite with an aqueous solution selected from the group consisting of ammonium salt solutions, rare earth salt solutions, alkaline earth salt solutions and transition metal salt solutions and mixtures thereof, to a final alkali content of less than about 6 percent by weight calculated as the alkali oxide; and

d. recovering said highly stable crystalline aluminosilicate zeolite.

3,933,984

PROCESS OF MANUFACTURING WHISKER CRYSTALLINE SILICON CARBIDE

Isao Kimura, Suita, and Hidetsugu Habata, both of Osaka, Japan, assignor to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1971, Ser. No. 125,469

Claims priority, application Japan, Mar. 27, 1970, 45-26397; Mar. 27, 1970, 45-26398; Apr. 16, 1970, 45-32823

Int. Cl. C01b *31/36*

U.S. Cl. 423—345 **10 Claims**

1. A process of manufacturing whisker crystalline silicon carbide which comprises heating a reaction system containing

1. a solid phase consisting essentially of fine solid particles of silicon dioxide-containing inorganic material, and

2. a gaseous mixture consisting essentially of chlorine-containing material and aliphatic hydrocarbon,

said chlorine-containing material being selected from the group consisting of chlorine, hydrogen chloride, tetrachloromethane and phosgene,

the reaction system being heated to a reaction temperature of 800° to 2200°C in the substantial absence of oxygen and nitrogen to produce crystalline silicon carbide whiskers.

3,933,985

PROCESS FOR PRODUCTION OF POLYCRYSTALLINE SILICON

Michael A. Rodgers, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 24, 1971, Ser. No. 183,584

Int. Cl.² C01B *33/00, 33/02, 33/08*

U.S. Cl. 423—350 **4 Claims**

1. In a process producing polycrystalline silicon by the hydrogen reduction of trichlorosilane with hydrogen to produce silicon, unreacted trichlorosilane, and silicon tetrachloride and separating the trichlorosilane from the silicon tetrachloride, the improvement which comprises mixing the separated silicon tetrachloride with hydrogen to form a mixture consisting essentially of silicon tetrachloride and hydrogen; reacting said mixture in the absence of any other reactive material or catalyst at a temperature between 900° and 1100°C, at a dwell time of the order of several seconds and directly thereafter separating the trichlorosilane from the resultant product therefrom for use in the production of polycrystalline silicon.

3,933,986

PROCESS FOR PRODUCING CARBON FIBERS

Yasuo Matsumura; Soichiro Kishimoto, and Masahiko Ozaki, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Japan

Filed Apr. 11, 1974, Ser. No. 460,147

Claims priority, application Japan, Apr. 25, 1973, 48-47010

Int. Cl.² C01B *31/07*

U.S. Cl. 423—447 **13 Claims**

1. A process for producing carbon fibers which comprises (a) treating preoxidized fibers produced by heating acrylonitrile fibers in an oxygen-containing atmosphere at a temperature between 150°C and 400°C with a reducing liquid containing at least one compound selected from the group consisting of thiosulfuric acid, polythionic acid, dithionic acid, sulfurous acid, pyrosulfurous acid dithionous acid ($H_2S_2O_4$) and their salts, and (b) thereafter carbonizing or graphitizing the thus treated fibers in a non-oxidizing atmosphere at a temperature above 800°C.

3,933,987

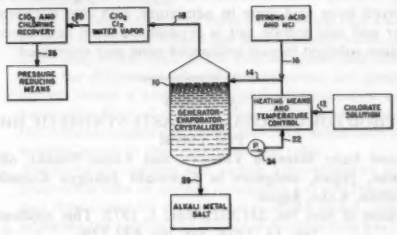
SIMULTANEOUS PRODUCTION OF CHLORINE DIOXIDE AND A SALT OF A STRONG ACID

Arthur C. Schulz, North Tonawanda, and Herbert J. Rosen, Yonkers, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 589,114, Oct. 24, 1966, abandoned. This application Sept. 17, 1970, Ser. No. 72,941

Int. Cl.² C01B *11/02*

U.S. Cl. 423—478 **7 Claims**

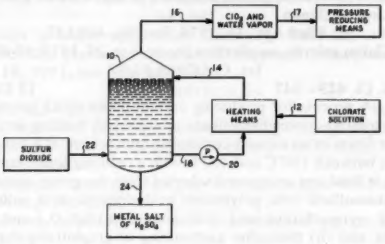


1. In a continuous process for the production of chlorine dioxide, chlorine and an inorganic salt wherein a reducing agent is continuously introduced into an aqueous reaction solution maintained from about 1–12 normal in mineral acid and from 0.005 to about 3.5 molar in chlorate at a temperature between 30° to about 90° centigrade to produce chlorine dioxide and a solid inorganic salt, the improvement which comprises conducting said continuous process by introducing hydrochloric acid as the reducing agent into a unilocular zone containing said reaction solution under reduced pressure of from 50 to about 600 millimeters mercury absolute, wherein said pressure is coordinated with the temperature of the reaction solution to effect the evaporation of water from said aqueous reaction solution at a rate sufficient to maintain a substantially constant volume of reaction solution, whereby chlorine dioxide and chlorine are continuously generated and removed from said zone in admixture with said evaporated water and said inorganic salt is crystallized from said aqueous reaction solution in said unilocular zone and recovered.

3,933,988
METHOD OF SIMULTANEOUSLY PRODUCING CHLORINE DIOXIDE AND A SULFATE SALT

Herbert J. Rosen, Yonkers, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 589,113, Oct. 24, 1966, abandoned. This application Sept. 17, 1970, Ser. No. 72,924
Int. Cl.² C01B *11/02*
U.S. Cl. 423—480 **8 Claims**

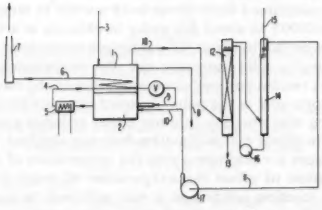


1. In a continuous process for the production of chlorine dioxide and a sulfate salt wherein a reducing agent is continuously introduced into an aqueous reaction solution maintained from about 1–12 normal in sulfuric acid and from 0.005 to about 3.5 molar in chlorate at a temperature between 50° to 95° centigrade to produce chlorine dioxide and solid sulfate salt, the improvement which comprises conducting said continuous process by introducing SO_2 as the reducing agent into a unilocular zone containing said reaction solution under reduced pressure of from 50 to about 700 millimeters mercury absolute, wherein said pressure is coordinated with the temperature of the reaction solution to effect the evaporation of water from said aqueous reaction solution at a rate sufficient to maintain a substantially constant volume of reaction solution, whereby chlorine dioxide is continuously generated and removed from said zone in admixture with said evaporated water and said sulfate salt is crystallized from said aqueous reaction solution in said unilocular zone and recovered.

3,933,989
METHOD FOR DISPOSAL OF WASTE SYNTHETIC HIGH POLYMER

Hayami Itoh; Mamoru Yamada, and Yasuo Nozaki, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Division of Ser. No. 231,532, Mar. 3, 1972. This application Jan. 11, 1974, Ser. No. 432,728
Claims priority, application Japan, Mar. 4, 1971, 46-12001
Int. Cl.² C01B *7/08*; F23G *7/00*
U.S. Cl. 423—481 **6 Claims**



1. A method for the disposal treatment of a mixture of a relatively thermally stable waste synthetic high polymer which is fusible at temperatures below 500°C and a thermally unstable waste synthetic high polymer which includes chlorine containing materials, which comprises:

a. providing a heating vessel;

b. heating said waste synthetic high polymer in said vessel at a temperature of 200° to 500°C, thereby to melt said thermally stable portion thereof to form a hot molten bath in said vessel; and

c. simultaneously with step (b) deomposing said thermally unstable portion of said waste synthetic high polymer to form hydrogen chloride and to form hydrocarbon gas and removing said hydrogen chloride and hydrocarbon gas from said vessel;

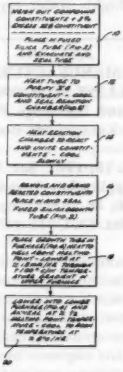
d. separating the removed hydrogen chloride from the hydrocarbon gas and burning at least a portion of said hydrocarbon gas as fuel for heating said waste synthetic high polymer in step (b); and

e. after substantially all the chlorine has been removed from said waste synthetic high polymer, disposing of said hot molten bath.

3,933,990
SYNTHESIZATION METHOD OF TERNARY CHALCOGENIDES

Anthony L. Gentile, Thousand Oaks, and Oscar M. Stafsudd, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 11, 1969, Ser. No. 849,001
Int. Cl.² C01B *19/00*, *17/00*; B01J *17/08*
U.S. Cl. 423—508 **25 Claims**



1. A method for synthesizing a single crystal selected from the ternary chalcogenides consisting of the IB-As-VIB and Tl-As-VIB Groups of the Periodic Table of Elements, where the IB elements consist of copper and silver and where the VIB elements consist of sulfur, selenium and tellurium, said ternary chalcogenides having a single stable solid phase between room temperature and their melting points, comprising the steps of:

utilizing a purification tube of fused silica having a reaction chamber, a sublimation chamber, and an open neck portion connecting the chambers,

placing stoichiometric quantities of the arsenic constituent of the crystal in the sublimation chamber and the remaining consitutents of the crystal in the reaction chamber and placing an approximate additional 3% quantity of the VIB constituent in excess of stoichiometry in the reaction chamber,

evacuating the purification tube to approximately 10^{-6} Torr and sealing the purification tube,

placing the sublimation chamber and its contained arsenic constituent in a furnace while leaving the reaction chamber and its contained constituents outside the furnace,

heating the sublimation chamber and its arsenic constituent sufficient for permitting substantially complete vaporization and movement of the resulting arsenic vapors into the reaction chamber through the open neck portion,

cooling the purification tube and sealing off the reaction chamber at the neck portion,

placing the sealed reaction chamber in a furnace and uniformly heating the crystal constituents contained in the reaction chamber to at least the reaction temperature of the contained crystal contituents for a time sufficient for obtaining full reaction of the contained crystal constituents,

cooling the reacted crystal constituents uniformly,

breaking the reaction chamber and removing the crystal material therefrom,

grinding the crystal material,

placing the ground crystal material in a fused silica crystal growth tube having an elongated nucleation neck portion at one end thereof,

evacuating the growth tube to approximately 10^{-6} Torr, backfilling the growth tube with approximately 250 Torr pure helium, and sealing the growth tube,

placing the sealed growth tube and its contained crystal material in a furnace apparatus comprising two furnace parts having a separation therebetween, the first furnace part having a temperature profile comprising an isothermal temperature portion and a decreasing temperature gradient of at least 100°C per inch and the second furnace part having an isothermal temperature profile at a temperature above the lowest temperature of the decreasing temperature gradient,

heating the crystal material in the first furnace part within the isothermal temperature portion thereof to a temperature substantially above the melting point of the crystal material for forming a melt therefrom,

lowering and rotating the growth tube and its contained crystal material melt from the first furnace isothermal temperature portion and through the decreasing temperature gradient at approximately 1.8 millimeters per hour for nucleating and growing the single crystal,

further lowering the growth tube and its contained single crystal into the second furnace part within the isothermal temperature profile thereof and stopping movement therein for a time sufficient for annealing the single crystal,

cooling the second furnace part, the growth tube and the annealed crystal at a rate of approximately 5°C per hour to room temperature, and

dissolving the growth tube in hydrofluoric acid without applying mechanical pressure to the crystal for removing the single crystal.

3,933,991
SULFURIC ACID CONTACT PROCESS

Ludwig Dorn, Cologne; Gerhard Heinze, Schildgen; Jürgen Wokulat, Leverkusen; Wilhelm Möller, Leverkusen, and Franz Rübsam, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 229,163, Feb. 24, 1972, Pat. No. 3,793,230, which is a continuation of Ser. No. 36,234, May 11, 1970, abandoned. This application Aug. 3, 1973, Ser. No. 385,378

Claims priority, application Germany, May 23, 1969, 1926564

Int. Cl.² C01B *17/78*

U.S. Cl. 423—535 **3 Claims**

1. In a process of producing sulfur trioxide by contacting sulfur dioxide, oxygen and a catalyst at an elevated temperature in a fluidized bed process the improvement which comprises utilizing as the catalyst, a silica gel bonded bead form catalyst comprising a siliceous support having at least 97% by weight silica and a finite amount up to 8% by weight of V_2O_5 and 3.1 to 12.4% by weight of K_2O, based on the weight of the catalyst, said catalyst having a proportion of pores with diameters from about 100 to 1500 A of at least 80% of the total pore volume present, said catalyst having an abrasion resistance of from about 0 to 3% by weight.

3,933,992
PROCESS FOR AUTOMATED REGULATION OF SULFUR PRODUCTION UNITS

Guillaume Andral, Pau; Michel Carmassi, Mazeres-Lezons; Bernard Louvel, Buros; Jacques Maurice, Mourenx, and Georges Vandesande, Argagnon, all of France, assignors to Societe Anonyme dite: Societe Nationale Des Petroles D'Aquitaine, Paris, France

Continuation of Ser. No. 207,790, Dec. 14, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 458,900

Claims priority, application France, Dec. 18, 1970, 70.45812

Int. Cl.² C01B *17/02*

U.S. Cl. 423—573 **5 Claims**

1. A process for regulating the production of sulphur in a sulphur unit producing sulphur by oxidation of hydrogen sulfide by means of a free oxygen-containing gas and liberating residual gases containing H_2S and SO_2, said method comprising the steps of:

a. feeding a hydrogen sulfide-containing gas and a free oxygen-containing gas to the inlet of the sulphur unit;

b. automatically analyzing the hydrogen sulfide-containing gas fed to the sulphur unit for its hydrogen sulfide content and providing electrical signals indicative of said H_2S content,

c. electronically computing from said electrical signals the theoretical flow of oxygen-containing gas needed to oxidize the hydrogen sulfide of the hydrogen sulfide-containing gas to sulphur to keep the $H_2S : SO_2$ molar ratio in the residual gases to a predetermined value and providing a signal representative of said theoretical flow,

d. automatically analyzing the residual gases obtained from the sulphur unit for their H_2S and SO_2 contents and providing residual gas electronic signals indicative of said residual gas contents,

e. electronically computing from said residual H_2S and SO_2 content electronic signals the instantaneous value of the $H_2S : SO_2$ molar ratio in the residual gases and deriving from the difference of said instantaneous and predetermined values a correction signal representative of the correction flow of oxygen-containing gas to bring back the instantaneous value of the $H_2S : SO_2$ molar ratio in the residual gases to the predetermined value,

f. electronically adding the signals representative of the theoretical flow of oxygen containing gas and the correction flow signal for providing a resulting signal, and

g. adjusting the ratio of the flow of H_2S containing gas to the flow of oxygen-containing gas by varying the flow of oxygen-containing gas in response to the resulting signal, whereby the instantaneous value of the $H_2S : SO_2$ molar ratio in the residual gas is adjusted to the predetermined value.

3,933,993
USE OF CONCENTRATED CHELATED IRON REAGENT FOR REDUCING POLLUTANT CONTENT OF A FLUID

Robert M. Salemme, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 28, 1974, Ser. No. 484,216

Int. Cl.² C01B *17/04*; **B01D** *53/34*

U.S. Cl. 423—573 **9 Claims**

1. A method for reducing the pollutant content of a gas stream wherein the pollutant is at least one member of the group of hydrogen sulfide and mercaptans, comprising the steps of:

a. bringing the gas stream into intimate contact with an aqueous solution having a pH from greater than 7 to about pH 10 consisting essentially of water, a chelate of

ferric iron with ethylenediaminetetraacetic acid (EDTA), and a buffering agent, said solution having a ratio of EDTA to Fe of greater than 1:1, the concentration of the Fe being at least about 0.5 moles per liter of the aqueous solution,

b. separating insolubles from the reacted aqueous solution,

c. bringing the reacted aqueous solution substantially free of insolubles into intimate contact with an oxygenating gas and

d. recirculating the regenerated aqueous solution for reaction with the gas stream as in step a).

3,933,994

PROCESS FOR DESULFURIZING GASES

Gerald L. Rounds, Fontana, Calif., assignor to Kaiser Steel Corporation, Fontana, Calif.

Filed Mar. 20, 1974, Ser. No. 452,988

Int. Cl.² C01B *17/04*

U.S. Cl. 423—575 **2 Claims**

1. A continuous process for desulfurizing the coke oven gas and sinter plant gas resulting from operation of an integrated steel mill and forming elemental sulfur which comprises,

a. conveying a stream of sinter plant gas from its source to a heat exchanger to extract heat from said gas;

b. contacting the cooled stream of sinter plant gas with a citric acid-containing solution to reduce the SO_2 content of said stream and increase the SO_2 content of said solution;

c. returning the resulting stream of gas to the said heat exchanger to return heat thereto;

d. discharging the resulting gas of increased temperature into a stack;

e. contacting a stream of coke oven gas free of by-product constituents with the solution resulting from step b) to reduce the H_2S content of said coke oven gas stream and increase the H_2S content of said solution;

f. the relative rates of flow of the two said gas streams being such that the amount of H_2S and SO_2 contained in the solution resulting from step e) is substantially in the ratio of two moles of H_2S to one mole of SO_2, whereby elemental sulfur precipitates out of the solution;

g. removing precipitated sulfur from the last said solution, and

h. passing at least a portion of the solution resulting from step f) to step a).

3,933,995

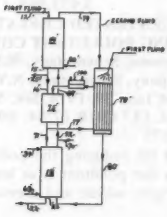
DUAL TEMPERATURE ISOTOPE EXCHANGE SYSTEM

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Continuation of Ser. No. 828,926, July 16, 1959, abandoned, which is a continuation-in-part of Ser. No. 188,925, Sept. 29, 1950, Pat. No. 2,895,803. This application Mar. 12, 1971, Ser. No. 123,815

Int. Cl.² C01B *5/02*

U.S. Cl. 423—580 **6 Claims**



1. An improvement of a method of producing a substance containing concentrated therein an isotope of an element by exchanging, at two different temperatures, said isotope with another isotope of the same element between chemically different fluid substances which are physically separable from each other and which are capable of containing each of said isotopes, which method comprises, in combination, the steps of (a) establishing a countercurrent flow of the two substances in a series of at least two pairs of exchange units; (b) mixing said two fluids in each of said exchange units to cause an exchange of isotopes of the element between the two fluids; (c) maintaining a first unit of each pair at a temperature to cause the first fluid flowing therethrough to become enriched and the second fluid flowing therethrough to become improverished with respect to said isotope; and (d) maintaining the second unit of each pair at a temperature to cause the second fluid flowing therethrough to become enriched and the first fluid flowing therethrough to become impoverished with respect to said isotope; (e) transferring a first part of the flow of enriched first fluid from the first unit of each pair to the second unit of said pair and (f) transferring a second part of the flow of enriched first fluid from the first unit of each pair except the last of said pairs to the first unit of the next succeeding pair; (g) transferring a first part of the flow of enriched second fluid from the second unit of each pair to the first unit of said pair and (h) transferring a second part of said flow of enriched second fluid from the second unit of each pair except the last to the second unit of the next succeeding pair of units; (i) transferring impoverished first fluid from the second unit of each pair of units except the first pair to the second unit of the next preceding pair of units; (j) transferring impoverished second fluid from the first unit of each pair of units except the first pair to the first unit of the next preceding pair of units; (k) delivering a flow of impoverished second fluid to the second unit of a pair of units; and (l) removing as product enriched fluid from the last pair of exchange units of said series; and in which said flows of first fluid are liquid flows; said improvement comprising the combination in said method of the cooperating steps of:

(m) establishing a liquid cyclic flow of enriched first fluid;

(n) passing the liquid cyclic flow of enriched first fluid established in step (m), and a flow of enriched first fluid being transferred from a first unit to a second unit of a pair of units in step (e), into direct contact with enriched second fluid being transferred from a second unit to a first unit of said pair of units in step (g);

(o) maintaining said liquid cyclic flow separated from said flows of second fluid except for the direct contact in step (n); and

(p) effecting heat transfer between the liquid cyclic flow of enriched first fluid established in step (m) and the flow of impoverished second fluid being delivered in step (k).

3,933,996

COMPOSITION COMPRISING RADIOACTIVE LABELED-FIBRINOGEN AND ALBUMIN

John Cecil Charlton, and David Lawrence Gravett, both of Amersham, England, assignors to The Radiochemical Centre Limited, Amersham, England

Filed June 19, 1973, Ser. No. 371,529

Claims priority, application United Kingdom, June 22, 1972, 29401/72

Int. Cl.² A61K *43/00, 35/16, 37/02*

U.S. Cl. 424—1 **10 Claims**

1. A solid product comprising one part by weight of fibrinogen labelled with a radioactive iodine isotope, and from 1 to 1,000 parts by weight of albumin to reduce or prevent unwanted decomposition of the fibrinogen.

3,933,997

SOLID PHASE RADIOIMMUNOASSAY OF DIGOXIN

Leroy S. Hersh, Painted Post, and Sidney Yaverbaum, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,251

Int. Cl.[2] A61K *43/00*; G01T *1/16*, *1/167*; G21H *5/02*

U.S. Cl. 424—1 7 Claims

1. A method of determining the concentration of digoxin in a solution comprising the steps of:

A. reacting the solution, a known amount of radioactively labelled digoxin, and a composite consisting of anti-digoxin antibodies coupled chemically through an intermediate silane coupling agent to magnetically responsive inorganic particles, to form immunochemical complexes;

B. magnetically separating the composite from the reaction solution;

C. counting the radioactivity of either the removed composite or the remaining solution; and

D. relating the count of step (C) to a standard to determine the digoxin concentration.

3,933,998

4-[2-(ISOPROPYLAMINO)ETHYL]PYROCATECHOL INTRAOCULAR PRESSURE LOWERING PROCESS

Richard J. Seidehamel, and Kendrick W. Dungan, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Nov. 4, 1974, Ser. No. 520,388

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—28 5 Claims

1. A process for lowering elevated intraocular pressure in a patient suffering from primary open angle glaucoma comprising topically applying to said patient's eyes an effective ophthalmologically acceptable amount for lowering intraocular pressure of a compound selected from the group consisting of 4-[2-(isopropylamino)ethyl]pyrocatechol and ophthalmologically acceptable acid addition salts thereof.

3,933,999

ORGANIC COMPOUNDS

Lucien Craps, Basel, Switzerland, assignor to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

Filed Dec. 17, 1973, Ser. No. 425,121

Claims priority, application Switzerland, Dec. 22, 1972, 018770/72

Int. Cl.[2] A61K *9/32*, *9/58*, *31/40*, *31/415*

U.S. Cl. 424—31 15 Claims

1. A pharmaceutical composition useful for the treatment of Rhinitis comprising as active agents

a. 1-methyl-2-[2-(α-methyl-p-chloro-diphenylmethyloxy)ethyl]pyrrolidine in free base form or in pharmaceutically acceptable acid addition salt form, and b) a compound selected from the group consisting of 2-amino-1-phenylalkan-1-ol of 2 to 4 alkanol carbon atoms, napthylmethyl, or tetraline, or phenylalkyl of 1 to 3 carbon atoms, napthylmethyl or tetraline, mono, di or tri substituted by alkyl of 1 to 4 carbon atoms wherein the phenyl is unsubstituted or mono- or disubstituted by hydroxy and the amino is unsubstituted or mono- or disubstituted by alkyl of 1 to 4 carbon atoms and imidazoline substituted in the 2-position by phenylalkyl of 1 to 3 carbon atoms, wherein the weight ratio of active agent a) to active agent b) is from about 1:10 to about 1:60, and a pharmaceutically acceptable carrier therefor.

3,934,000

TOOTHPASTES

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 301,934, Oct. 30, 1972, abandoned. This application Oct. 16, 1974, Ser. No. 515,272

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 5 Claims

1. A transparent toothpaste having improved body and texture, comprising a dental vehicle of aqueous humectant; about 3–7% silica thickeners; about 5–50% dental abrasive having an empirical SiO_2 content of at least 70%, a particle size of about 2 to 20 microns, an essentially amorphous X-ray structure, and an index of refraction which is about the same as that of the vehicle; said vehicle containing about 0.2–2% sodium carboxymethylcellulose having about 0.6 to 0.8 carboxymethyl groups per anhydroglucose unit, and about 1–10% polyethylene glycol having an average molecular weight of about 550–650, the graph of its molecular weight distribution being a bell-shaped curve, at least one-half by weight of said polyethylene glycol being molecular weights above 400 and below 800.

3,934,001

ORAL COMPOSITIONS CONTAINING GERMICIDALLY ACTIVE PLASTIC POWDERS

Charles Andrew Watson, Ruislip, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 836,217, June 12, 1969, abandoned, which is a continuation of Ser. No. 599,692, Dec. 7, 1966, abandoned. This application July 31, 1970, Ser. No. 64,126

Claims priority, application United Kingdom, Dec. 7, 1965, 51752/65

Int. Cl.[2] A61A *7/16*

U.S. Cl. 424—49 6 Claims

1. In a liquid mouthwash preparation having a liquid vehicle and an effective amount of a germicide suitable for use in oral hygiene, the improvement which comprises providing said germicide in the form of non-toxic, water-insoluble thermoplastic resinous particles having a size less than 50 microns, said particles being impregnated with said germicide suitable for use in oral hygiene in an amount of at least about 0.1 per cent of said particles by weight.

3,934,002

ORAL COMPOSITIONS FOR PLAQUE, CARIES AND CALCULUS RETARDATION WITH REDUCED STAINING TENDENCIES

John William Haefele, St. Petersburg, Fla., assignor to The Procter & Gamble Company, Cincinnati, Ohio

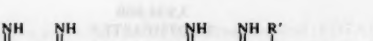
Continuation-in-part of Ser. No. 429,254, Dec. 28, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 338,464, March 6, 1973, and Ser. No. 338,472, March 6, 1973, abandoned, each is a continuation-in-part of Ser. No. 267,816, June 30, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,495

Int. Cl.[2] A61K *7/18*, *6/24*

U.S. Cl. 424—54 36 Claims

1. An oral composition effective in inhibiting the formation of plaque, caries and calculus comprising:

A. from about 0.01 to about 2.5% by weight of a bis-biguanide compound having the generic formula:



wherein A and A' each represent either (1) a phenyl radical which can contain as a substituent up to two alkyl or alkoxy groups containing from 1 to about 4 carbon atoms, a nitro group, or a halogen atom; (2) an alkyl group containing from 1 to about 12 carbon atoms; or (3) alicyclic groups containing from 4 to about 12 carbon atoms; wherein X and X' each represent an alkylene radical containing from 1 to 3 carbon atoms; wherein z and z' each can be either 0 or 1; wherein R and R' each represent either hydrogen, an alkyl radical containing from 1 to about 12 carbon atoms, or an aralkyl radical containing from 7 to about 12 carbon atoms; wherein n is an integer from 2 to 12 inclusive; and wherein the polymethylene chain $(CH_2)_n$ can be interrupted by up to 5 ether, thioether, phenyl or naphthyl moieties; or the pharmaceutically acceptable salts thereof;

B. from about 0.01 to about 10% by weight of an anti-calculus compound in excess over that which reacts with said bis-biguanide compound to form an insoluble salt where such reaction occurs, said anti-calculus compound being zinc phenolsulfonate;

c. balance, a carrier which is suitable for use in the oral cavity.

3,934,003

COSMETIC COMPOSITION CONTAINING AN ETHOXYLATED GLYCERIDE MIXTURE

Rudolf Tuma, Witten-Ruhr, and Fritz Neuwald, Brammer ueber Nortorf, Holstein, both of Germany, assignors to Chemische Werke Witten GmbH, Germany

Continuation of Ser. No. 645,618, June 13, 1967, abandoned, which is a continuation-in-part of Ser. No. 338,561, Jan. 20, 1964, abandoned. This application Jan. 23, 1973, Ser. No. 326,077

Claims priority, application Germany, Apr. 13, 1963, 29651

Int. Cl.[2] A61K *7/42*

U.S. Cl. 424—59 **32 Claims**

1. A water-soluble and fat-restoring composition which consists of an ethoxylated glyceridic mixture of saturated vegetable fatty acids of about 8 to 14 carbon atoms, said mixture comprising the monoglycerides and diglycerides of said acids having chemically linked thereto about 2 to 8 moles of ethylene oxide per free hydroxyl group, said ethoxylated glyceridic mixture having an acid number of from 0.1 to 0.2, a saponification number of from 65 to 120 and a hydroxyl number of from 130 to 260.

3,934,004

STAIN RESISTANT ANTI-PERSPIRANT COMPOSITION

Leonard J. Orren, 8408 Wornall Road, Kansas City, Mo. 64111

Filed Mar. 9, 1973, Ser. No. 339,934

Int. Cl.[2] A61K *7/38*

U.S. Cl. 424—68 **5 Claims**

1. In an anti-perspirant composition containing as the active ingredient an astringent aluminum salt and a dermatologically-acceptable vehicle, the improvement wherein the composition comprises a cosmetically-acceptable reducing agent in an amount of about 0.01 to 10 percent by weight, based on the total weight of the composition, and sufficient to inhibit staining of fabric in contact with the composition and with perspiration, the reducing agent being water dispersible, essentially odorless, non-irritating to skin and a member selected from the group consisting of:

a. ammonium sulfite, alkali-metal sulfite, alkaline-earth-metal sulfite, zinc sulfite or a mixture thereof;

b. ammonium bisulfite, alkali-metal bisulfite, alkaline-earth-metal bisulfite or a mixture thereof;

c. sodium dithionate, zinc dithionate or a mixture;

d. alkali-metal meta-bisulfite;

e. alkali-metal thiosulfate, alkaline-earth-metal thiosulfate or a mixture thereof;

f. 2-thiobarbituric acid mono-substituted-2-thiobarbituric acid in which a substituent is in the 2- or the 5-position, disubstituted-2-thiobarbituric acid in which each substituent is in one of the 2- and 5-positions or a mixture thereof;

g. 2-pyridinethione;

h. alkylamine bisulfite;

i. sodium formaldehyde bisulfite;

j. sodium formaldehyde sulfoxylate, zinc formaldehyde sulfoxylate or a mixture thereof;

k. acetone sodium bisulfite;

l. cysteine, homocysteine, N-acetyl cysteine, N-acetyl homocysteine, homocysteine thiolactone, S-cysteine sulfonate sodium, cysteine-S-phosphate sodium or a mixture thereof;

m. penicillamine;

n. thiomalic acid;

o. thiosalicylic acid;

p. 2-mercaptoethylamine hydrochloride;

q. dithiothreitol;

r. thiourea dioxide;

s. thiazolidine-2-carboxylic acid;

t. ammonium hypophosphite, alkali-metal hypophosphite, alkaline-earth-metal hypophosphite or a mixture thereof;

u. ammonium phosphite, alkali-metal phosphite, alkaline-earth-metal phosphite or a mixture thereof;

v. tetrakis(hydroxymethyl)phosphonium chloride; and

w. dermatologically-acceptable stannous salt.

3,934,005

REDUCED SPRAY DRIFT METHOMYL COMPOSITIONS

Robert Eyer Albert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1974, Ser. No. 457,912

Int. Cl.[2] A61K *31/74;* **A01N** *9/06, 9/20*

U.S. Cl. 424—78 **3 Claims**

1. A single-phase liquid methomyl composition consisting essentially of 15 to 40 percent by weight of methomyl; 0.03 to 1.5 percent by weight of polyoxyethylene having a molecular weight of one million to 7 million; 0 to 50% by weight of water; and a solvent selected from the group consisting of methanol, acetone, cyclohexanone, and cyclohexanol.

3,934,006

PHARMACEUTICAL COMPOSITIONS COMPRISING SACCHARASE INHIBITORS

Werner Frommer; Walter Puls, and Delf Schmidt, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 336,720, Feb. 28, 1973, Pat. No. 3,879,546. This application June 24, 1974, Ser. No. 482,661

Claims priority, application Germany, Mar. 1, 1972, 2209832

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—115 **6 Claims**

1. A pharmaceutical composition comprising as an active ingredient a therapeutically effective quantity of a saccharase inhibitor mixed with a pharmaceutical diluent, wherein said saccharase inhibitor is produced by a process which comprises subjecting to hydrolytic degradation a polysaccharidic or oligosaccharidic amylase inhibitor derived from microorganisms of the order Actinomycetales.

3,934,007

METHOD OF REMOVING TOXIC SUBSTANCES FROM THE INTESTINAL TRACT BY THE USE OF A SURFACTANT AND A SORBENT

Robert Zalmon Gussin, Suffern, N.Y., and Lewis Smith Meriwether, Westport, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 373,068, June 25, 1973, abandoned. This application Mar. 27, 1974, Ser. No. 455,455

Int. Cl.² A61K *31/225, 33/43*

U.S. Cl. 424—125 5 Claims

1. A method of facilitating the removal of urea, creatinine and ammonia from the intestinal tract of a warm-blooded animal which comprises orally administering to said animal an effective urea, creatinine and ammonia lowering amount of a composition of 1 part dioctyl sodium sulfosuccinate and from 10–10,000 parts of at least one sorbent selected from the group consisting of activated carbon, oxystarch and oxycellulose.

3,934,008

N-ACYL AND DESAMINO HUMAN CALCITONIN AND ANALOGS THEREOF

Werner Rittel, Basel; Max Brugger, Birsfelden; Bruno Kamber, Basel; Bernhard Riniker, Frenkendorf; Peter Sieber, Reinach, all of Switzerland, and Hendrik Marie Greven, Heesch, Netherlands, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

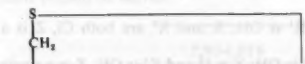
Continuation of Ser. No. 850,254, Aug. 14, 1969, abandoned. This application July 14, 1972, Ser. No. 271,873

Claims priority, application Switzerland, Aug. 23, 1968, 12691/68; Aug. 27, 1968, 12811/68; Aug. 30, 1968, 13067/68; Oct. 10, 1968, 15147/68; Nov. 19, 1968, 17235/68

Int. Cl.² A61K *37/00*; C07C *103/52*; C07G *7/00*

U.S. Cl. 424—177 19 Claims

1. A peptide of the formula



R—CH(CH₂—S—S—CH₂)—CO—Gly—Asn—Leu—Ser—Thr—Cys—Met—Leu—Gly—Thr—Tyr—Thr—Gln—Asp—Phe—Asn—Lys—Phe—His—Thr—Phe—Pro—Gln—Thr—Ala—Ile—Gly—Val—Gly—Ala—Pro—NH₂ (I)

in which R is hydrogen or acylamino wherein acyl is a lower monobasic or dibasic alkanoyl, lower alkyloxycarbonyl, benzyloxycarbonyl, pyroglutamyl, carbamoyl, N-lower alkylcarbamoyl, N-phenylcarbamoyl, or N-phenylthiocarbamoyl, and, in addition, compounds of Formula I in which one or more of the asparagine and glutamine residues are exchanged for the aspartic acid or glutamic acid residue, respectively, or the aspartic acid residue is exchanged for the asparagine residue and, in addition, compounds of formula I in which R is amino and one or more of the asparagine and glutamine residues are exchanged for the aspartic acid or glutamic acid residue, respectively, or the aspartic acid residue is exchanged for the asparagine residue; as well as therapeutically acceptable acid addition salts and complexes with a member selected from the group consisting of zinc phosphate, zinc pyrophosphate, zinc hydroxide, gelatine, polyphloretin phosphate, and polyglutamic acid, with the proviso that all amino acid residues other than glycine and β-mercaptopropionic acid are of the L-configuration.

3,934,009

AGENTS FOR LOWERING THE LIPID LEVEL IN PLASMA

Karl Friedrich Gey, Reinach; Joseph Kiss, Arlesheim; Hans Lengsfeld, Reinach; Willy Schuep, Birsfelden, and Pierre-Charles Wyss, Muttenz, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 9, 1975, Ser. No. 539,662

Claims priority, application Switzerland, Jan. 25, 1974, 1038/74

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 7 Claims

1. A composition useful for lowering the lipid level in plasma comprising N-nicotinoylglucosamine and a pharmaceutical carrier material.

3,934,010

INSECTICIDAL COMPOSITION AND METHOD UTILIZING PHOSPHORIC ACID PHENYLSULPHONAMIDE ESTERS

Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

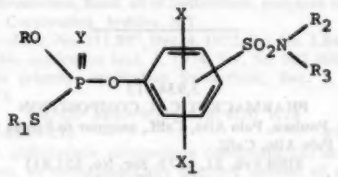
Division of Ser. No. 310,507, Nov. 29, 1972, Pat. No. 3,855,362. This application Sept. 23, 1974, Ser. No. 508,592

Claims priority, application Switzerland, Dec. 3, 1971, 17619/71; Sept. 22, 1972, 13869/72

Int. Cl.² A01N *9/36*

U.S. Cl. 424—211 8 Claims

1. An insecticidal and acaricidal composition comprising an insecticidally and acaricidally effective amount of a compound of the formula



wherein R represents methyl or ethyl, R_1 represents propyl, n-butyl, n-pentyl or $C_2H_5OCH_2CH_2$—, R_2 represents hydrogen, methyl or ethyl, R_3 represents methyl or ethyl, X and X_1 each represents hydrogen or chlorine, and Y represents oxygen or sulphur, together with a suitable carrier therefor.

3,934,011

COMBATING INSECTS AND ACARIDS WITH S-DIPHENYLMETHYL-DITHIOPHOSPHATES

Odd Kristiansen, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

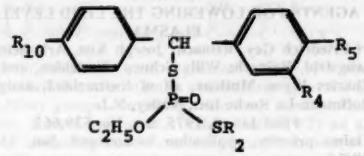
Division of Ser. No. 437,414, Jan. 28, 1974, Pat. No. 3,884,998. This application Mar. 4, 1975, Ser. No. 555,207

Claims priority, application Switzerland, Feb. 7, 1973, 1755/73; Dec. 20, 1973, 17773/73

Int. Cl.² A01N *9/36*

U.S. Cl. 424—216 10 Claims

1. A composition for combatting pests selected from the group consisting of insects and acarids comprising (1) as active ingredient a pesticidally effective amount of a compound of the formula



wherein R_2 represents ethylthiomethyl or propargyl; and each of R_4, R_5 and R_{10} represents hydrogen, chlorine or methoxy; and (2) an inert carrier.

3,934,012

METHOD OF SEPARATING HYDROGEN SULFIDE FROM CARBON DIOXIDE

Vernon Hugo Schievelbein, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 263,910, June 19, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,906
Int. Cl.² B01D 53/34
U.S. Cl. 423—232 26 Claims

1. A method for preferentially removing hydrogen sulfide from a gas mixture comprising hydrogen sulfide and carbon dioxide which comprises

treating the gas mixture at atmospheric pressure with an aqueous solution consisting of inert salts and bicarbonate ions in sufficient concentration to establish an equilibrium imbalance to prevent substantial dissolution of carbon dioxide.

3,934,013

PHARMACEUTICAL COMPOSITION

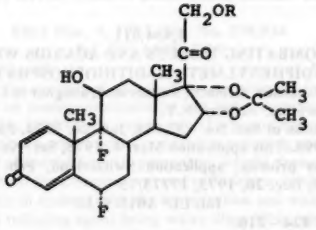
Boyd J. Poulsen, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 21, 1975, Ser. No. 551,811
Int. Cl.² A61K 31/56
U.S. Cl. 424—239 50 Claims

1. A topical, anti-inflammatory, pharmaceutical composition which comprises

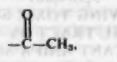
a. a pharmaceutically acceptable solvent and

b. at least two corticosteroids, each dissolved in said solvent at a concentration equal to the saturation solubility for each corticosteroid, said corticosteroids being chosen from the group represented by the following formulas:

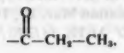


wherein

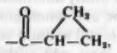
in compound (A) R is



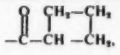
in compound (B) R is H,
in compound (C) R is



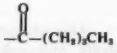
in compound (D) R is

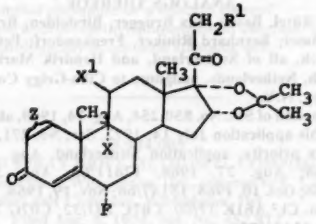


in compound (E) R is

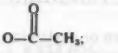


in compound (F) R is

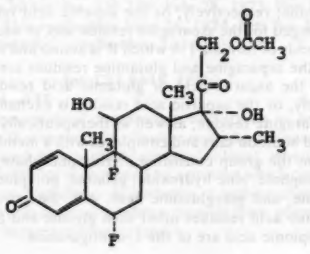




in compound (G) R^1 is F; X and X^1 both Cl, Z is a double bond;
in compound (H) R^1 is OH; X and X^1 are both Cl, Z is a double bond;
in compound (I) R^1 is OH; X is H and X^1 is OH, Z is a single bond;
in compound (J) R^1 is



X is H, and X^1 is OH, Z is a double bond; and compound (K) is



3,934,014

N-METHYL-IMIDAZOLE DERIVATIVES AS ANTI-MYCOTIC AGENTS

Wilfried Draber; Karl Heinz Büchel; Erik Regel, and Manfred Plempel, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

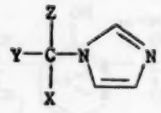
Division of Ser. No. 310,423, Nov. 29, 1972. This application May 31, 1974, Ser. No. 474,873

Claims priority, application Germany, Mar. 23, 1970, 2013793

Int. Cl.² A61K *31/505*

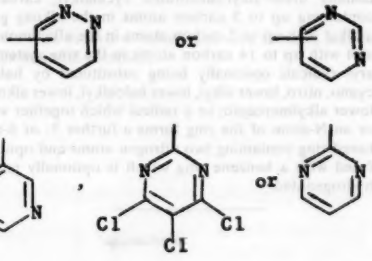
U.S. Cl. 424—251 16 Claims

1. A pharmaceutical composition useful for treating mycotic infections in humans and animals which comprises an antimycotically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein

X is



Y is phenyl or p-fluorophenyl, and

Z is phenyl,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,934,015

ORAL MALE ANTIFERTILITY METHOD AND COMPOSITIONS

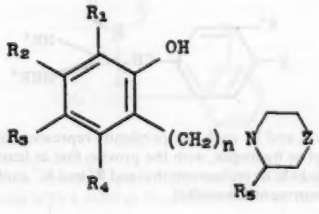
Alfred Boris, Parsippany-Troy Hills, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 5, 1970, Ser. No. 87,328

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 8 Claims

1. A method for inducing an antifertility effect in a male aves or mammal, which comprises orally or parenterally administering an antifertility effective amount of a compound of the formula



wherein

Z is —O— or —CH_2—, R_1 independently is hydrogen, N-piperidino-lower alkyl and N-α-pipecolino lower alkyl, R_2, R_3 and R_4 independently are hydrogen or lower alkyl, R_1, R_2, R_3 and R_4 taken together as adjacent pairs are lower alkyl having from 3 to 5 carbon atoms, R_5 is hydrogen or lower alkyl and *n* is 1 or 2

or the enantiomer or acid addition salts thereof to said aves or mammal.

3,934,016

PHARMACEUTICAL PREPARATION FOR PERCUTANEOUS TREATMENT OF LOCAL EDEMAS

Claude Paul Roux, Paris, and Dieran Robert Torossian, Montrouge, both of France, assignors to Jouveinal, S.A., Val-de-Marne, France

Filed May 24, 1971, Ser. No. 146,298

Claims priority, application France, Apr. 15, 1971, 71.13326

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 2 Claims

1. A pharmaceutical composition for local percutaneous treatment of edemas which comprises an anhydrous ointment having the following composition:

10 parts of acetazolamide

75 parts of poly-oxy-ethylene glycol 1,500

15 parts of poly-oxy-ethylene glycol 300

3,934,017

ANTHELMINTIC COMPOSITION AND METHOD UTILIZING ISOTHIOCYANOBENZAZOLES ACTIVE INGREDIENTS

Jean-Jacques Gallay, Magden; Rene Bosshard, Birsfelden, and Paul Brenneisen, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

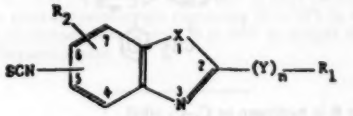
Division of Ser. No. 311,987, Dec. 4, 1972, Pat. No. 3,849,431. This application Sept. 3, 1974, Ser. No. 502,480

Claims priority, application Switzerland, Dec. 7, 1971, 17875/71

Int. Cl.² A01N *9/12, 9/18, 9/20, 9/28*

U.S. Cl. 424—270 8 Claims

1. An anthelmintic composition comprising (a) as active ingredient, an anthelmintically effective amount of a compound of the formula



wherein the SCN-group is in the 4-, 5-, 6- or 7-position,

R_1 represents hydrogen, a straight-chain or branched alkyl or alkenyl radical having at most 17 carbon atoms, an alkyl or alkenyl radical having a total of at most 6 carbon atoms and substituted by halogen, —CN, —OH, C_1–C_3 alkoxy, C_1–C_3 alkylthio or di-(C_1–C_3)alkylamino, an optionally C_1–C_3 alkyl-substituted mono-, bi- or tricyclic cycloalkyl or cycloalkenyl radical having 3 to 10 carbon atoms in the ring structure, which can also be bound by way of a CH_2-group to the substituent Y or to the 2-position of the heterocycle,

R_2 represents hydrogen, halogen or an alkyl or alkoxy radical having at most 4 carbon atoms,

X represents oxygen, sulphur or

$-NR_3$,

R_3 represents hydrogen, an alkyl or alkenyl radical having at most 5 carbon atoms, a phenyl or benzyl radical, a dimethylamino- or diethylamino-alkyl radical having 2 – 5 carbon atoms in the alkyl chain, an alkoxycarbonyl radical having 2 – 5 carbon atoms, acetyl, propionyl, trichloroacetyl, benzoyl, or a C_4–C_7 saccharide group,

Y represents oxygen, sulphur, —SO—, $-SO_2-$, or $-NR_4-$,

n is the number 0 or 1,

R_4 represents hydrogen, an alkyl or alkenyl radical having at most 5 carbon atoms, or together with the N-atom and the substituent R_1 a saturated or unsaturated heterocycle having 4 to 6 carbon atoms which may also contain a further hetero atom O or S selected from the group consisting of pyrrolidine, piperidine, 2-methylpiperidine, 4-methylpiperidine, piperazine, N′-methyl, N′,N′-dimethyl and N′-ethyl-piperazine, morpholine, isomorpholine, thiomorpholine and hexamethyleneimine, or the group

$-N-R_5$,

and

R_5 stands for hydrogen, methyl or ethyl,

or their acid addition salts non-toxic for warm-blooded animals together with (b) a carrier.

3,934,018

4,6-DIHYDRO-1,3-DIMETHYL-8-PHENYL-PYRAZOLO[4,3-e] [1,4]DIAZEPIN-5-(1H)-ONE AND DERIVATIVES AS ANTI-INFLAMMATORY AGENTS

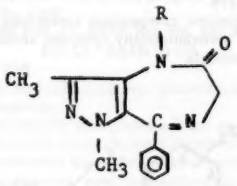
Leo Ralph Swett, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Sept. 3, 1970, Ser. No. 69,464

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 **4 Claims**

1. A method of relieving the symptoms of inflammation in a patient in need of such treatment by administering to said patient a therapeutically effective amount of a compound of the formula



where R is hydrogen or C_1–C_7 alkyl.

3,934,019

PESTICIDAL 4,5-BIS-(TRIFLUOROMETHYLIMINO)-DIAZOLES

Hans-Joachim Scholl, Cologne; Erich Klauke, Odenthal; Ferdinand Grewe, Burscheid, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

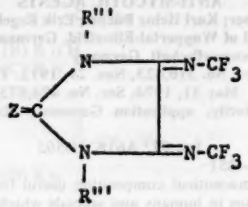
Continuation-in-part of Ser. No. 206,159, Dec. 8, 1971, Pat. No. 3,787,435. This application Oct. 3, 1973, Ser. No. 403,296

Claims priority, application Germany, Dec. 18, 1970, 2062346

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—273 **18 Claims**

1. A fungicidal, insecticidal or acaricidal composition comprising a fungicidally, insecticidally or acaricidally effective amount of a compound of the formula



in which

Z is oxygen, R—N= or

and

R, R′, R″ and R‴ are each hydrogen; alkyl, alkenyl or alkynyl with up to 8 carbon atoms optionally substituted by halogen, cyano, lower alkoxy or alkylmercapto; optionally lower-alkyl-substituted cycloalkyl; carbalkoxy containing up to 5 carbon atoms in the alkoxy group; aralkyl with up to 2 carbon atoms in the alkyl moiety or aryl with up to 14 carbon atoms in the ring system, the aryl radicals optionally being substituted by halogen, cyano, nitro, lower alkyl, lower haloalkyl, lower alkoxy or lower alkylmercapto; or a radical which together with Z or an N-atom of the ring forms a further 5- or 6-membered ring containing two nitrogen atoms and optionally fused with a benzene ring which is optionally partially hydrogenated.

3,934,020

HALOPHENYL ACETAMIDINES AS ANXIOLYTIC ANTIDEPRESSANTS

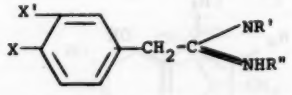
Abdulmuniem H. Abdallah, and Philip J. Shea, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1974, Ser. No. 510,958

Int. Cl. A61k *31/155*

U.S. Cl. 424—326 **7 Claims**

1. A method useful for alleviating symptoms of central nervous system depression and anxiety in an animal comprising administering to an animal an amount of a compound selected from the group consisting of a substituted amidine and a pharmacologically-acceptable salt thereof effective to alleviate said symptoms, the substituted amidine corresponding to the formula:



wherein X and X′ each independently represent halo, trifluoromethyl or hydrogen, with the proviso that at least one of X and X′ is halo or trifluoromethyl and R′ and R″ each independently represent loweralkyl.

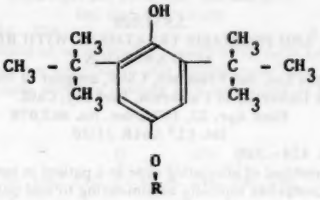
3,934,021

PREVENTION OF APPLE SCALD

Alan Stokoe Taylor, Croydon, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Apr. 1, 1975, Ser. No. 564,209
Claims priority, application Australia, Apr. 22, 1974, 7323/74
Int. Cl.² A23F 1/06; C01B 33/08
U.S. Cl. 424—341 7 Claims

1. A method for preventing or inhibiting scald on apples which method comprises applying to said apples an effective amount of a composition comprising as active ingredient a compound selected from the group consisting of the compounds of the formula



wherein R is methyl or ethyl, and salts thereof; and an inert carrier material therefore.

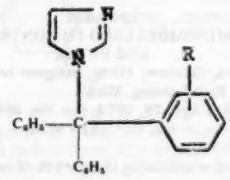
3,934,022

N-TRITYL-IMIDAZOLES AS PLANT FUNGICIDES

Karl Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Ferdinand Grewe, Burscheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 789,601, Jan. 7, 1969, abandoned. This application Sept. 2, 1970, Ser. No. 69,110
Claims priority, application Germany, Jan. 29, 1968, 1670976
Int. Cl.² A01H 9/22
U.S. Cl. 424—273 14 Claims

1. An antifungal composition useful against fungal plant diseases which comprises antifungal effective amount of a compound of the formula:



wherein R is o-methyl, p-methyl, o-ethyl, or o-isopropyl, in combination with a solid or liquid diluent or carrier.

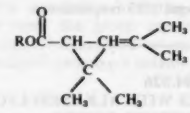
3,934,023

INSECTICIDAL D-CIS, TRANS-CHRYSANTHEMATES

Yoshitoshi Okuno, Toyonaka; Akira Toyoura, and Akio Higo, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

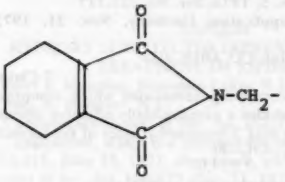
Filed Sept. 26, 1973, Ser. No. 401,034
Claims priority, application Japan, Sept. 29, 1972, 47-98458
Int. Cl.² A01N 9/22, 9/24, 9/28
U.S. Cl. 424—274 19 Claims

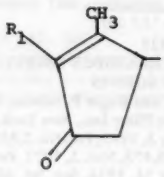
1. An insecticidal composition for use against mosquitoes, flies, cockroaches, leafhoppers and cut worms containing as an active ingredient an insecticidally effective amount of (+)-cis, transchrysanthemate of the formula,



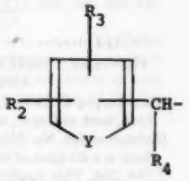
(I)

wherein R is a member selected from the group consisting of the radicals,





and



in which R_1 is allyl or propargyl, R_2 is propargyl, benzyl or phenoxy, R_3 is hydrogen or methyl, R_4 is hydrogen or ethynyl, and Y is —CH = CH— or oxygen, and an inert carrier, said (+)-cis, trans-chrysanthemate containing 10 to 30% by weight of (+)-cis-chrysanthemate and 70 to 90% by weight of (+)-trans-chrysanthemate.

3,934,024

METHOD OF PRODUCING ANALGESIA AND COMPOSITIONS USEFUL THEREIN

Raj Kumar Razdan, Belmont, and Harry George Pars, Lexington, both of Mass., assignors to Sharps Associates, Cambridge, Mass.

Continuation-in-part of Ser. No. 210,170, Dec. 20, 1971, Pat. No. 3,883,551, which is a continuation-in-part of Ser. No. 852,928, Aug. 25, 1969, abandoned. This application Feb. 18, 1975, Ser. No. 550,286
Int. Cl.² A61K 31/38
U.S. Cl. 424—275 2 Claims

1. A method of relieving pain in a mammalian patient suffering therefrom comprising administering to said patient a therapeutically effective amount of 1,2-dihydro-5,5-dimethyl-10-hydroxy-8-(3-methyl-2-octyl)-3H,5H-thiopyrano[2,3-c][1]benzopyran.

3,934,025

SYNERGISTIC COMPOSITIONS CONTAINING N-ALKYL (C_{12}40%, C_{14}-50%, C_{16}-10%)DIMETHYL BENZYL AMMONIUM CHLORIDE AND THEIR USE AS SLIMICIDES

Paul Swered, and Mary Anne Girard, both of Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jan. 30, 1975, Ser. No. 545,674
Int. Cl.² A01N 9/20
U.S. Cl. 424—298 8 Claims

1. A composition for the control of the microorganism AEROBACTER AEROGENES in aqueous systems comprising a mixture of 1,3-dichloroacetone oxime acetate, and n-alkyl (C_{12}40%, C_{14}50%, C_{16}10%) dimethyl benzyl ammonium chloride wherein the weight ratio of the acetate to the chloride ranges from about 95:5 to about 5:95 respectively.

3,934,026

COMBATING NEMATODES WITH ALKANESULFONIC ACID 2-BROMOETHYL ESTERS

Karl Heinz Büchel, Wuppertal, and Bernhard Homeyer, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 5, 1974, Ser. No. 521,117
Claims priority, application Germany, Nov. 21, 1973, 2358017
Int. Cl.² A01N 9/14
U.S. Cl. 424—303 7 Claims

1. A method of combating nematodes which comprises applying to the nematodes a nematocidally effective amount of an alkane-sulfonic acid 2-bromoethyl ester of the formula

$$R—SO_2—O—CH_2—CH_2—Br$$

in which

R is an alkyl radical with 1 to 5 carbon atoms.

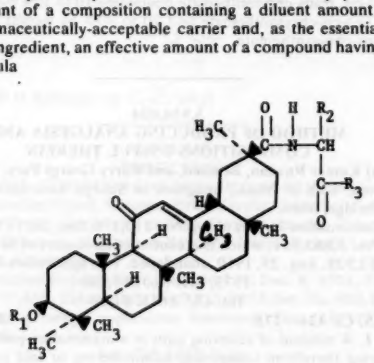
3,934,027

18β-GLYCYRRHETINIC ACID AMIDES USEFUL AS ANTIULCER AGENTS

Hans-Jurgen E. Hess, Old Lyme, and Roger P. Nelson, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 356,774, May 3, 1973, Pat. No. 3,859,328, which is a division of Ser. No. 195,475, Nov. 3, 1971, Pat. No. 3,766,206. This application June 24, 1974, Ser. No. 482,056
Int. Cl.² A61K 31/235
U.S. Cl. 424—309 6 Claims

1. A method for the control of peptic ulcers in animals in need of said treatment which comprises administering intraperitoneally or orally to the animals an effective antipeptic ulcer amount of a composition containing a diluent amount of a pharmaceutically-acceptable carrier and, as the essential active ingredient, an effective amount of a compound having the formula



wherein

R_1 is selected from the group consisting of hydrogen, alkanoyl having from two to six carbon atoms and ω-carboxyalkanoyl having a total of from 4 to 5 carbon atoms;

R_2 is selelcted from the group consisting of benzyl, 4-hydroxybenzyl, 3,4-dihydroxybenzyl, and 3,5-dibromo-4-hydroxybenzyl; and

R_3 is selected from the group consisting of hydroxy and alkoxy having from one to four carbon atoms; or a pharmaceutically-acceptable alkali metal salt thereof when the compound has at least one carboxy group.

3,934,028

ACNE AND PSORIASIS TREATMENT WITH RETINOIC ACID ANALOGS

Kwan-hua Lee, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 22, 1974, Ser. No. 463,078
Int. Cl.² A61K 31/20
U.S. Cl. 424—318 5 Claims

1. A method of alleviating acne in a patient in need thereof which comprises topically administering to said patient in an amount effective for remission of said acne of 11-(2,6′, 6′ trimethylcyclohex-1′enyl-1′)-5,9-dimethylundeca-2,4,6,8,10-pentenoic acid.

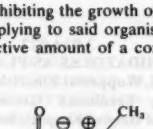
3,934,029

CERTAIN AMINIMIDES USED TO CONTROL BACTERIA AND FUNGI

Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, East Lansing, Mich.

Filed Apr. 29, 1974, Ser. No. 465,120
Int. Cl.² A01N 9/20
U.S. Cl. 424—320 7 Claims

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein R is a C_{11} – C_{17} straight chain aliphatic hydrocarbon group and R′ is methyl, 2-hydroxyethyl or 2-hydroxypropyl.

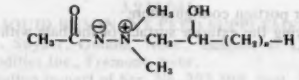
3,934,030

CERTAIN AMINIMIDES USED TO CONTROL BACTERIA AND FUNGI

Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, East Lansing, Mich.

Filed Apr. 29, 1974, Ser. No. 465,118
Int. Cl.² A01N 9/20
U.S. Cl. 424—320 5 Claims

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein n is an integer of from 10–16.

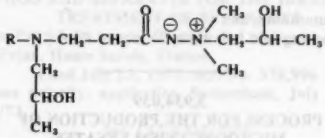
3,934,031

CERTAIN AMINIMIDES USED TO CONTROL BACTERIA AND FUNGI

Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, East Lansing, Mich.

Filed Apr. 29, 1974, Ser. No. 465,119
Int. Cl.² A21N 9/20
U.S. Cl. 424—320 **4 Claims**

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein R is a C_{12} – C_{18} alkyl group.

3,934,032

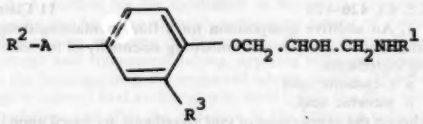
ALKANOLAMINE DERIVATIVES FOR TREATING HYPERTENSION

Arthur Michael Barrett, Leeds; John Carter, Macclesfield; Roy Hull, Macclesfield; David James Le Count, Macclesfield, and Christopher John Squire, Macclesfield, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 233,781, March 10, 1972, Pat. No. 3,836,671, which is a continuation-in-part of Ser. No. 199,011, Nov. 15, 1971, abandoned, and Ser. No. 9,451, Feb. 6, 1970, Pat. No. 3,663,607. This application Apr. 15, 1974, Ser. No. 461,262

Claims priority, application United Kingdom, Feb. 21, 1969, 9445/69; Sept. 24, 1969, 47048/69; Nov. 19, 1970, 55028/70; Nov. 18, 1971, 53544/71
Int. Cl.² A61K 27/00
U.S. Cl. 424—324 **2 Claims**

1. A method for the treatment of hypertension in a warm-blooded animal in need of such treatment which comprises administering orally, parenterally or by inhalation to said animal an effective amount of at least one alkanolamine derivative selected from the group consisting of a compound of the formula:



wherein R^1 is isopropyl or t-butyl, R^2 is carbamoyl or alkylcarbamoyl of up to 4 carbon atoms, A is alkylene of 1 to 5 carbon atoms or alkenylene of 2 to 5 carbon atoms and R^3 is hydrogen, halogen or alkyl, alkenyl or alkoxy each of up to 4 carbon atoms; and a non-toxic, pharmaceutically acceptable acid-addition salt thereof.

3,934,033

METHOD FOR DISTRUPTING NORMAL INSECT MATURATION

Morton Beroza, Silver Spring; Rafael Sarmiento, Laurel, and Terrence P. McGovern, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 343,328, March 21, 1973, Pat. No. 3,873,724. This application Nov. 26, 1974, Ser. No. 527,320
Int. Cl.² A01N 9/24
U.S. Cl. 424—341 **7 Claims**

1. A method of protecting flour from insects selected from the group consisting of the yellow mealworm, *Tenebrio molitor* (L.) and the confused flour beetle, *Tribolium confusum* Jacquelin duVal comprising incorporating into said flour an effective maturation inhibiting amount of a compound selected from the group consisting of 7-ethoxy-1-(p-ethylphenoxy)-3,7-dimethyl-2-octene and 1-(p-ethylphenoxy)-3,7-dimethyl-7-propoxy-2-octene.

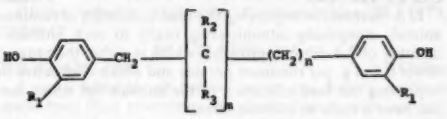
3,934,034

HYDROXY SUBSTITUTED DIPHENYLALKYLS FOR TREATMENT OF LIPIDEMIA

Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 282,316, Aug. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 153,416, June 15, 1971, abandoned, which is a continuation-n-part of Ser. No. 100,533, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 60,745, Aug. 3, 1970, abandoned. This application Aug. 9, 1973, Ser. No. 386,947
Int. Cl.² A61K 31/05
U.S. Cl. 424—346 **19 Claims**

1. A method for treating lipidemia, which comprises orally administering to a mammal in need of said treatment an anti-hyperlipidemic effective amount of a compound of the formula:



where

m is 0, 1 or 2;

n is 0 or 1;

R_1 represents hydrogen or hydroxy; and

R_2 and R_3 each independently represents hydrogen or methyl provided that when m is 0, n is 0 and that when m is 1 or 2, n is 1 and R_1 is hydroxy and that when m is 2 each R_2 can be the same or different and each R_3 can be the same or different or

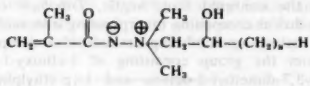
a pharmaceutically acceptable alkali or alkaline earth metal salt thereof.

3,934,035
CERTAIN AMINIMIDES USED TO CONTROL BACTERIA AND FUNGI

Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, East Lansing, Mich.

Filed Apr. 29, 1974, Ser. No. 465,121
Int. Cl.² A01N 9/20
U.S. Cl. 424—320 8 Claims

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein n is an integer of from 1–16.

3,934,036
N-BENZENESULFONYL-β-ALANINE HYDRAZIDE USEFUL AS AN IMMUNOSUPPRESSIVE AGENT

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Seiyaku Kabushiki Kaisha, Japan

Filed Jan. 23, 1975, Ser. No. 543,772
Int. Cl.² A61K 31/18
U.S. Cl. 424—321 5 Claims

1. A pharmaceutical composition in oral dosage unit form comprising a pharmaceutical carrier and from about 20 to 400 mg per unit of N-benzenesulfonyl-β-alanine hydrazide.

4. A method of treating autoimmune disease in the human body comprising administering an effective amount of the composition of claim 1.

3,934,037
FEED COMPOSITION AND METHOD USING 2,3-DIBROMOPROPANOL

Joseph J. Lewis, and John E. Trei, both of West Chester, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed May 2, 1974, Ser. No. 466,114
Int. Cl.² A61K 31/045
U.S. Cl. 424—343 5 Claims

1. A method for improving the feed utilization of ruminant animals comprising administering orally to such animals a quantity of 2,3-dibromopropanol which is within the range of about 0.1–6 g. per ruminant per day and which is effective for improving the feed efficiency of the animals but which does not have a toxic or noxious effect.

3,934,038
GLUTATHIONE COATED SHREDDED TRASH AS FISH FOOD

Donald M. Kerr, Philadelphia, Pa., assignor to Total Disposal Systems, Inc., Fort Washington, Pa.

Filed Nov. 6, 1972, Ser. No. 304,297
Int. Cl.² A01K 67/00
U.S. Cl. 426—1 1 Claim

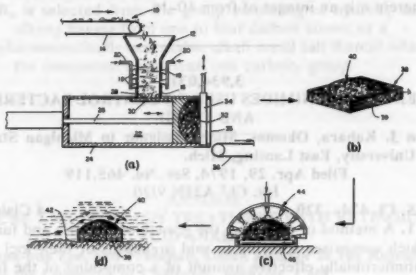
1. A method for disposing of shreaded municipal trash while at the same time utilizing said trash to provide food for fish, said method comprising:

a. spraying the shreaded trash with a solution of glutathione;

b. compressing the sprayed shreaded trash into a bale having a rectangular base configuration and a semi-spherical upper portion configuration;

c. spraying the exterior surface of the bale with a solution of glutathione; and

d. depositing said bale onto the ocean floor.



3,934,039
PROCESS FOR THE PRODUCTION OF MICROORGANISM LYSATES

Giuliano Cardini, and Aldo Zotti, both of Milan, Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,346
Claims priority, application Italy, Nov. 30, 1972, 32277/72
Int. Cl.² A23J 1/18
U.S. Cl. 426—7 5 Claims

1. A process for the production of microorganism lysates, which comprises preparing an aqueous suspension containing 5 to 15% by weight of the microorganisms cells; thermal shocking the microorganisms by spray-drying by introducing the aqueous suspension of the microorganisms into spraying, pulverising, or atomizing equipment or prilling towers, feeding air or an inert gas as the evaporating medium into said equipment, said gas being preheated to a temperature of from about 150° to 400°C, for a contact time of from about 1 to 40 seconds to reduce the water content of the suspension of microorganisms to below about 10% by weight; suspending the product resulting from the spray-drying treatment in water and subjecting the microorganisms suspended in water to autolysis by heating said suspension to a temperature of from about 30° to 50°C for a time of from about 10 to 48 hours.

3,934,040
BAKERY PRODUCT AND PROCESS

Louis J. Smerak, Wayne, and Jason A. Miller, Dover, both of N.J., assignors to Caravan Products Co., Inc., Totowa, N.J.

Filed Oct. 18, 1973, Ser. No. 407,453
Int. Cl.² A21D 8/04, 2/22, 2/24
U.S. Cl. 426—20 11 Claims

1. An additive composition for a flour containing dough, said additive composition consisting essentially of the following ingredients:

a. L-cysteine; and

b. ascorbic acid,

wherein the proportions of said ingredients are based upon the weight of 100 pounds of said flour in said dough and are in the following amounts:

a. 0.001 to .012 pound; and

b. 0.0015 to .04 pound,

including in said composition enzymes selected from the group consisting of fungal alpha amylase enzyme; fungal protease enzyme; bromelain enzyme; and, papain enzyme.

3,934,041

LIQUID RUMINANT FEED SUPPLEMENT

Frank M. Snyder, Omaha, Nebr., assignor to Liquid Feed Commodities Inc., Fremont, Nebr.

Continuation-in-part of Ser. No. 293,308, Sept. 29, 1972, abandoned. This application Oct. 30, 1972, Ser. No. 301,789

Int. Cl.[2] A23K *1/22*

U.S. Cl. 426—69 5 Claims

1. A method for the preparation of a liquid feed supplement composition for ruminants, comprising the steps of reacting a reaction mixture consisting essentially of water, urea and a lower aliphatic aldehyde selected from the group consisting of formaldehyde, acetaldehyde, propionaldehyde and mixtures thereof, wherein the mole ratio of the aldehyde to the urea ranges up to 5.5, in the presence of molasses and 0.001 to 1.0 parts by weight of a catalyst selected from the group consisting of phosphoric acid, ammonium sulfate, ammonium phosphate and ammonium polyphosphate per part by weight of urea for a time sufficient to permit the urea to react with the aldehyde.

3,934,042

METHOD AND APPARATUS FOR THE IRRADIATIVE TREATMENT OF BEVERAGES

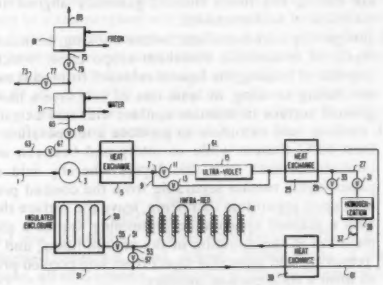
William Patrick De Stoutz, Chateau de Larringens, Larringes-sur-Evian, Haute Savoie, France

Filed July 13, 1973, Ser. No. 378,996

Claims priority, application Switzerland, July 13, 1973, 10499/73

Int. Cl.[2] A21D *6/00*

U.S. Cl. 426—248 6 Claims



1. A method for the irradiation of beverages, comprising passing the beverage through transparent tubing of circular cross-section, exposing the beverage to ultra-violet irradiation through said transparent tubing, applying infra-red radiation to the beverage in said transparent tubing, passing the beverage in indirect heat exchange with itself before the ultra-violet irradiation and after the exposure to the infra-red radiation, thereby to warm the entering beverage and cool the exiting beverage, maintaining the beverage out of contact with the air during at least said heat exchange and ultra-violet and infra-red exposure, maintaining the beverage at a pressure of 1.5 to 15 kgs/cm^2 during the exposures, and homogenizing the beverage, said homogenization being conducted between the ultra-violet exposure and the infra-red exposure.

3,934,043

PROCESS FOR MANUFACTURING HOLLOW PASTRIES

Franz Haas, Gerstlgasse 25; Franz Haas, Deublergasse 29, both of Vienna 21, and Johann Haas, Wiener Strasse 209, Spillern, N.O., all of Austria

Filed Mar. 22, 1974, Ser. No. 454,019

Claims priority, application Austria, Mar. 23, 1973, 2602/73

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—283 15 Claims

1. In a process for producing hollow filled pastries by the steps of providing a soft baked pastry strip, winding said pastry strip in an overlapping spiral about a spindle thereby providing said strip with a shape having a hollow interior, and filling said pastry with a moist filling, the improvement comprising the step of:

insulating the interior of said pastry strip from softening and dissolving effects of said filling by applying an insulating coating to said pastry strip prior to the step of winding said strip, so as to produce an insulating layer on said interior of said wound pastry strip;

whereby said insulating coating remains impervious and the soft filling cannot penetrate into the baked pastry.

3,934,044

REDUCING LEVELS OF SURFACE CONTAMINATION ON MEAT

Wayne A. Busch, Allison, Iowa; Robert E. Taylor, Glenview, and Robert B. Tompkin, La Grange, both of Ill., assignors to Swift and Company Limited, Chicago, Ill.

Filed Dec. 6, 1974, Ser. No. 530,177

Int. Cl.[2] A23L *1/31*

U.S. Cl. 426—326 10 Claims

1. A process for treating meat to destroy substantial amounts of psychrotrophic spoilage bacteria carried on the surfaces thereof, said process comprising contacting all surfaces of said meat with an aqueous solution of acetic acid having an acid concentration of from about 1–2.5% by weight, and having a temperature of from about 140°F. to 180°F. for a time period of from about 5 to 60 seconds.

3,934,045

PROCESS FOR PRESERVING BREAD AND BAKERY PRODUCTS WITH SORBIC ACID

Hans Fernholz, Fischbach, Taunus, and Hermann Neu, Neu-Isenburg, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 27, 1974, Ser. No. 483,677

Claims priority, application Germany, June 29, 1973, 2333142

Int. Cl.[2] A21D *2/14*

U.S. Cl. 426—331 5 Claims

1. A process for preserving bread and bakery products made from flour containing dough which comprises incorporating in said dough at least about 0.1% of crystalline sorbic acid of particle size ranging from about 100 to about 1000 μ m, said percent being by weight of flour in said dough, and baking said dough to make bread or a bakery product.

3,934,046

WATER LEACHING PRE-FRIED POTATO SLICES

Merle L. Weaver, Martinez, and Masahide Nonaka, Moraga, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 6, 1973, Ser. No. 348,568

Int. Cl.[2] A23L *1/20*

U.S. Cl. 426—418 6 Claims

1. A process for enabling the preparation of fried potato products of improved properties from raw potato pieces which exhibit excessive browning tendencies, which comprises -

a. pre-frying pieces of raw potato in oil at a temperature about from 325° to 375°F. for a time which is not long enough to cause said pieces to turn brown and which falls within the range of about 5 to 120 seconds, and
b. leaching the pre-fried pieces in water for a period about from 1 to 30 minutes, and
c. preparing said leached slices for consumption by frying.

3,934,047

TASTE MODIFIER FOR ARTIFICIAL SWEETENERS

Hans Robert Schade, Richland, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Apr. 2, 1974, Ser. No. 457,283
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **21 Claims**

1. A modified sweetening composition which comprises a dipeptide sweetener and a minor amount of a taste modifier selected from the group consisting of aluminum potassium sulfate, Naringin and mixtures thereof effective to modify the lingering sweet aftertaste of the dipeptide sweetener.

3,934,048

MULTIFUNCTIONAL SWEETENING COMPOSITION

Ivan Furda, Pleasantville, and Jerome F. Trumbetas, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 21, 1973, Ser. No. 417,855
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **9 Claims**

1. A process for producing a low calorie sweetening composition which is readily soluble in aqueous systems, low in hygroscopicity and devoid of aftertaste which alters the sweetness thereof which comprises:
a. forming an aqueous solution of a carbohydrate selected from the group consisting of maltose and dextrins having dextrose equivalent greater than 20;
b. heating the carbohydrate solution until the carbohydrate is completely solubilized;
c. adding a catalytic amount of phosphoric acid to the heated solution in order to catalyze the polymerization of the carbohydrate;
d. vacuum drying the acidified heated solution to form an acidified carbohydrate syrup;
e. vacuum heating the acidified carbohydrate syrup to obtain a polymer residue;
f. forming an aqueous solution of dipeptide sweetener with the polymer in a respective weight ratio range of about 1:19 to about 3:7.
g. drying the dipeptide sweetener/polymer solution.

3,934,049

GELLING AGENT FOR COLD SET PUDDING COMPOSITIONS

Robert M. Lauck, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 13, 1974, Ser. No. 469,156
Int. Cl.² A23L *1/187*
U.S. Cl. 426—573 **22 Claims**

1. A gelling agent combination for use in preparing a cold set milk pudding with a milk protein which comprises in combination:
a. an aqueous soluble alkali metal pyrophosphate;
b. an aqueous soluble alkaline earth metal orthophosphate;
c. an aqueous soluble alkali metal carbonate, wherein said alkali metal in said carbonate is sodium or potassium; and
d. a thickening agent selected from the group consisting of pregelatinized starch, gums, or mixtures thereof.

3,934,050

PROCESS FOR THE MANUFACTURE OF A COOKED FIBROUS RESTRUCTURED MEAT PRODUCT

Arthur Ernest Hawkins, Bedford, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 495,955, Aug. 9, 1974, abandoned.
This application Feb. 20, 1975, Ser. No. 551,801
Int. Cl.² A22C *18/00*
U.S. Cl. 426—645 **2 Claims**

1. A process for the manufacture of a cooked fibrous restructured meat product comprising:
i. extruding a meat comminute in the form of a flat extrudate having the fibers thereof generally aligned in the direction of said extrusion;
ii. interposing said extrudate, before cooking, between two layers of heat-stable absorbent crepe paper which are capable of holding the liquors released from said extrudate during cooking, at least one of said layers having a grained surface in intimate contact with said extrudate;
iii. cooking said extrudate to produce a temperature of at least 65°C therein while so interposed between and in intimate contact with said layers whereby said crepe paper layers remain separable from the cooked product and, upon separation therefrom, leave the surface thereof with a grained appearance resembling that of a slice of meat cut in the direction of the muscle fibers; and
iv. removing said separable layers from said cooked product to form a final cooked product.

3,934,051

PRODUCTION OF DRIED SODIUM CASEINATE WITH UNIFORM CONTENT OF TRACING COMPOUND FOR USE IN SAUSAGE

William C. Eastin, Sebastopol, Calif., assignor to Western Dairy Products Division of Chelsea Industries, Inc., San Francisco, Calif.

Filed Aug. 2, 1974, Ser. No. 494,047
Int. Cl.² A23L *1/31*
U.S. Cl. 426—652 **7 Claims**

1. A method of producing a dried sodium caseinate product for use as a traceable additive in sausage, said product having a uniformly and stably dispersed content of tin in an amount of the order of about 0.05% by weight, comprising mixing together sodium caseinate in aqueous solution with tin in the form of a water soluble salt of tin, and spray or roller drying the resulting solution.

3,934,052

METHOD FOR MANUFACTURING PASTRY

Kurt Kautz, Dahlenburg, and Otto Daetz, Bleckede, both of Germany, assignors to Molkereigenossenschaft Dahlenburg eGmbH, Germany

Continuation-in-part of Ser. No. 397,361, Sept. 14, 1973, abandoned, which is a continuation of Ser. No. 264,715, June 21, 1972, abandoned. This application June 6, 1974, Ser. No. 476,945

Claims priority, application Germany, July 17, 1971, 2135842

Int. Cl.² A23G *3/00*

U.S. Cl. 426—659 **9 Claims**

1. A method for manufacturing a composition for baking which comprises mixing sugar and fat, the ratio of sugar to fat being from about 2.5:1 to 3.5:1, with water in an amount from about 10 to 25 per cent by weight of the total mixture, boiling the mixture at about atmospheric pressure for a period of time sufficient to remove most of the moisture while allowing sufficient moisture to remain to avoid charring or burning of the remaining components, drying the boiled mixture to a residual moisture content of from about 1 to 2.5 per cent by weight based on the total weight of the final mixture under conditions whereby charring does not occur, and then powdering the dried mixture, said powdered mixture being capable of being baked without the necessity of adding any additional liquid.

3,934,053

CANDY FILLING WITH STABILIZED AROMA

John A. Kitson, Summerland, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 5, 1975, Ser. No. 556,501

Claims priority, application Canada, Mar. 8, 1974, 194449

Int. Cl.² A23G *3/00*

U.S. Cl. 426—659 **21 Claims**

1. A process for the preparation of fondant or flavoured syrup which comprises the steps of heating a sugars-containing mixture to a temperature and for a period of time sufficient to cause formation of a sugar polymers base but insufficient to cause browning or caramelization, diluting the resultant sugar polymers base with hot water to a total sugars content of from about 85 to about 95%, cooling the sugar polymers base and working same to a smooth paste, and blending with said paste desired flavour and aroma essences.

3,934,054

ELECTROLESS METAL PLATING

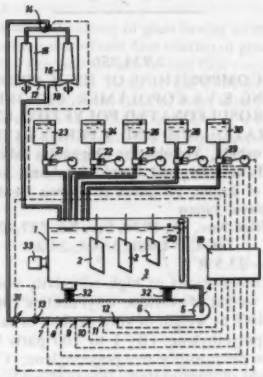
Edith-Luise Schmeling, Cologne-Deilbruck; Herbert Friebe, Cologne-Lindenthal, and Ulrich Reininghaus, Cologne-Nippes, all of Germany, assignors to Electro Chemical Engineering GmbH, Zug, Schweiz, Switzerland

Continuation-in-part of Ser. No. 852,685, Aug. 25, 1969, abandoned. This application Dec. 3, 1973, Ser. No. 421,106

Int. Cl.² C23C *3/02*

U.S. Cl. 427—8 **15 Claims**

1. An improved process for the electroless plating of a metal from an aqueous plating solution containing plating metal ions reducible to free metal, a reducing agent and an anticatalytic substance, the free metal depositing onto an article to be plated by being immersed into the plating solution contained in a container forming part of a suitable plating apparatus said apparatus including a supporting structure, while minimizng the random plating out of plating metal on those portions of the apparatus which come into contact with the plating solution, and maintaining an anticatalytic substance dissolved in the plating solution in concentrations from about 0.000001 mol per liter to about 0.1 mol per liter, the improvement consisting of: moving the apparatus relative to its supporting structure and said solution such as to maintain a relative speed of at least about 0.9 meter per second between the plating solution and portions of the container with which the plating solution comes into contact, while maintaining a relative speed of less than 0.9 meter per second between the plating



solution and the article immersed therein in order to obtain proper plating of said article with the plating metal.

3,934,055

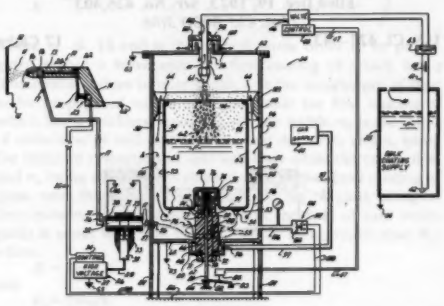
ELECTROSTATIC SPRAY METHOD

Simon Z. Tamny, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 465,539, April 30, 1974, Pat. No. 3,892,357. This application Jan. 23, 1975, Ser. No. 543,249

Int. Cl.² B05D *1/06*

U.S. Cl. 427—8 **9 Claims**



1. A method of electrostatically coating articles with electrically conductive material on a continuous basis with apparatus having all exposed surfaces thereof electrically grounded comprising:

transferring uncharged electrically conductive material from an electrically grounded bulk storage tank to an inner container which is enclosed by and supported in spaced relation to an electrically grounded outer container by an insulative support physically contacting both the inner and outer containers, without establishing an electrically conductive path between said bulk storage tank and said inner container,

transferring electrically conductive coating material through an electrically insulated conduit from said inner container to a spray device for emission thereby,

electrostatically charging electrically conductive coating material emitted by said spray device, and

sweeping a gas stream over said support while emitting electrostatically charged coating material to prevent deposition of a film of coating material on said support

sufficient to conduct a substantial level of electrical current from said inner container to said outer container.

3,934,056

RESIN COMPOSITIONS OF HIGH ADHESIVITY COMPRISING E/VA COPOLYMER, CHLORINATED OR CHLOROSULFONATED POLYETHYLENE, AN UNSATURATED ACID AND A PEROXY COMPOUND

Masaharu Yoshida, Yokohama; Shigenobu Ishihara, Tokyo; Tsuyoshi Takahashi, and Hiroki Imakura, both of Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,428
Int. Cl.² C08L 23/08, 23/28
U.S. Cl. 260—23.5 R 28 Claims

1. Resin compositions of high adhesivity comprising (A) 100 parts by weight of ethylene-vinyl acetate copolymer containing 1 to 40% by weight of vinyl acetate or said copolymer mixed with polyethylene; (B) 1 to 100 parts by weight of chlorinated or chlorosulfonated polyethylene; (C) 0.05 to 100 parts by weight of unsaturated carboxylic acids that are solid at room temperature; and (D) 0.005 to 10.0 parts by weight of organic peroxides.

3,934,057

HIGH SENSITIVITY POSITIVE RESIST LAYERS AND MASK FORMATION PROCESS

Wayne M. Moreau, Wappinger Falls, and Chiu H. Ting, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,403
Int. Cl.² B05D 3/06
U.S. Cl. 427—43 17 Claims

1. A high sensitivity resist layer structure comprising plural layers of resist coated on a substrate, each resist layer comprising a radiation degradable organic polymer with each successive resist layer being slower dissolving in resist developer than the resist layer it overlies both before and after exposure of said structure to said radiation.

8. A process for forming a resist mask comprising:

coating on a substrate a first layer of resist, said layer comprising a radiation degradable polymer,

coating on said first layer a second layer of resist said second layer comprising a radiation degradable polymer which is slower dissolving in resist developer than the polymer of said first layer both before and after exposure of both layers to said radiation,

exposing portions of said layers to high energy radiation and developing to remove the exposed portions of said layers to uncover said substrate by treating said layers with a solvent which preferentially dissolves the exposed portions.

3,934,058

METHOD OF STABILIZING THE HOT RESISTANCE OF CERAMIC POSITIVE TEMPERATURE COEFFICIENT RESISTORS

Baerbel Seebacher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 13, 1974, Ser. No. 478,855
Claims priority, application Germany, June 18, 1973, 2330908
Int. Cl.² B05D 5/12
U.S. Cl. 427—89 3 Claims

1. A method of stabilizing the hot resistance of a ceramic positive temperature coefficient resistor consisting of a barium titanate based ferroelectric material having a Perowskite structure which is doped so as to render in semiconductive, said resistor being provided with non-blocking contact coatings comprised predominantly of silver applied on a thin film of an indium material selected from the group consisting of indium and indium-gallium comprising:

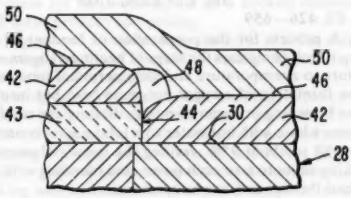
subjecting said positive temperature coefficient resistor to a heat-treatment over a period of time ranging from 1 to 40 hours at a temperature in the range of 400° to 500° C., said heat-treatment occurring at least after the application of said non-blocking contact coatings.

3,934,059

METHOD OF VAPOR DEPOSITION

Murray Arthur Polinsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,581
Int. Cl.² C23C 13/02
U.S. Cl. 427—90 6 Claims



1. A method of vapor depositing a metallic material onto a substrate within an evacuated evaporation chamber comprising the steps of:

depositing a first layer of said metallic material onto said substrate while maintaining said substrate at a first temperature,

heating said substrate to a second temperature, and

depositing a second layer of said same metallic material onto said first layer while maintaining said substrate at said second temperature.

3,934,060

METHOD FOR FORMING A DEPOSITED SILICON DIOXIDE LAYER ON A SEMICONDUCTOR WAFER

Dan L. Burt; Richard F. Taraci, both of Phoenix, and John E. Zavion, Mesa, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 19, 1973, Ser. No. 426,395
Int. Cl.² C23C 11/08
U.S. Cl. 427—95 6 Claims

1. In a method for depositing a silicon dioxide layer onto a wafer from a gaseous TEOS source flowing through a furnace tube, and the furnace is provided with a means for heating, and is further provided with a first end through which the gaseous TEOS source is admitted into the tube, and is further provided with a second end from which the residual gaseous

TEOS material is exhausted, the improvement comprising the steps of:

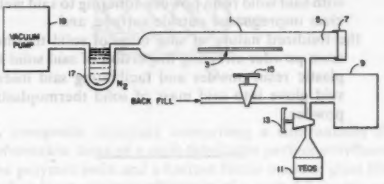
introducing a plurality of wafers into the furnace through the first end;

placing said plurality of wafers such that the broad surface of each of said wafers upon which the silicon dioxide material is to deposit is placed perpendicular to the direction of the gas flow;

spacing the wafers a minimum of 100 mils between adjacent surfaces;

heating the tube to a temperature for decomposing the TEOS;

exposing said TEOS to the effects of a vacuum for drawing the gaseous TEOS over the wafers while maintaining a



vacuum level below 1000 microns of mercury for maintaining an acceptable gas flow through the tube;

continuing the flow of the gaseous TEOS for a predetermined period and then closing off the flow of said gaseous TEOS;

maintaining the vacuum level first established for withdrawing any residual TEOS remaining in the system; and

withdrawing said wafers from the furnace by said first end.

4. The method of claim **1** further comprising the step of initially exposing said gaseous TEOS source to a vacuum to vaporize impurities therefrom.

6. The method of claim **4** further comprising the step of establishing a vacuum at the exhaust end of the tube for removing impurities from said wafers prior to introducing the TEOS into the tube.

3,934,061

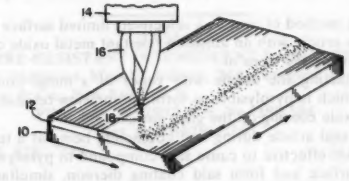
METHOD OF FORMING PLANAR OPTICAL WAVEGUIDES

Donald B. Keck, Big Flats, and Peter C. Schultz, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 239,701, March 30, 1972, Pat. No. 3,806,223. This application July 18, 1973, Ser. No. 380,482

Int. Cl.² C03C *17/02, 17/04;* **G02B** *5/14*

U.S. Cl. 427—165 **14 Claims**



1. A method of forming a planar optical waveguide for light propagation comprising the steps of:

providing a substantially flat glass substrate having a predetermined desired index of refraction,

applying a first coating of glass having an index of refraction greater than that of said glass substrate to at least a portion of one flat surface of said substrate to thereby form a film thereon, said first coating of glass having an outer exposed surface substantially parallel to said one flat surface of said substrate, the thickness of said first coating being defined by said surfaces, the width of said first coating being the dimension perpendicular to both said thickness and the light propagation axis of said first coating, and

applying a second coating of glass having an index of refraction less than that of said first coating of glass over at least said outer exposed surface of said first coating of glass to thereby form a film thereon, the thickness of said first coating of glass for any desired finite width thereof being equal to or less than the thickness a of a coating having an infinite width, thickness a being determined in accordance with one of the following equations

for TM_{0m} modes where m is an even integer

$$\frac{2a}{\lambda}(n_2^2-n_1^2)^{1/2} = m+1 + \frac{1}{\pi}\tan^{-1}\left(\frac{n_1^2-n_3^2}{n_2^2-n_1^2}\right)^{1/2}\left(\frac{n_2}{n_3}\right)^2$$

for TM_{0m} modes where m is an odd integer

$$\frac{2a}{\lambda}(n_2^2-n_1^2)^{1/2} = m+1 - \frac{1}{\pi}\cot^{-1}\left(\frac{n_1^2-n_3^2}{n_2^2-n_1^2}\right)^{1/2}\left(\frac{n_2}{n_3}\right)^2$$

for TE_{0m} modes where m is an even integer

$$\frac{2a}{\lambda}(n_2^2-n_1^2)^{1/2} = mG21 + \frac{1}{\pi}\tan^{-1}\left(\frac{n_1^2-n_3^2}{n_2^2-n_1^2}\right)^{1/2}$$

for TE_{0m} modes where m is an odd integer

$$\frac{2a}{\lambda}(n_2^2-n_1^2)^{1/2} = m+1 - \frac{1}{\pi}\cot^{-1}\left(\frac{n_1^2-n_3^2}{n_2^2-n_1^2}\right)^{1/2}$$

where $m \leq 10$ and is the highest mode order to be propagated within a waveguide the first coating of which has a thickness a and an infinite width, λ is the wavelength of light to be propagated within said waveguide the first coating of which has a thickness a and an infinite width, n_2 is the index of refraction of said first coating, and one of n_1 and n_3 being the index of refraction of said substrate while the other of n_1 and n_3 being the index of refraction of said second coating of glass, said thickness of said first coating of glass being so determinable where the propagation constant of said waveguide is equal to or less than K_1, where K_1 is greater than K_3, where

$$K_1 = 2\pi n_1/\lambda,$$

and

$$K_3 = 2\pi n_3/\lambda$$

the thickness of each said substrate and said second coating of glass being at least about two times the thickness of said first coating of glass.

11. A method of forming a planar optical waveguide for light propagation comprising the steps of:

providing a substantially flat glass substrate having a predetermined desired index of refraction,

applying a first coating of a glass having an index of refraction greater than that of said glass substrate to at least a portion of one flat surface of said substrate to thereby form a film thereon, said first coating of glass having an outer exposed surface substantially parallel to said one flat surface of said substrate, the thickness of said first coating being defined by said surfaces, the width of said first coating being the dimension perpendicular to both said thickness and the light propagation axis of said first coating, and

applying a second coating of glass having an index of refraction substantially equal to that of said substrate over at least said outer exposed surface of said first coating of

glass to thereby form a film thereon,

the thickness of said first coating of glass for any desired finite width thereof being equal to or less than the thickness a of a coating having infinite width, thickness a being determined in accordance with the following equation

$$2a/\lambda\,(n_2^2 - n_1^2)^{1/2} = m+1,$$

where $m \leq 10$ and is the highest mode order to be propagated within a wave-guide the first coating of which has a thickness a and an infinite width, λ is the wavelength of light to be propagated within said waveguide the first coating of which has a thickness a and an infinite width, n_2 is the index of refraction of said first coating, and n_1 is the index of refraction of said substrate and said second coating of glass, said thickness of said first coating of glass being so determinable where the propagation constant of said waveguide is equal to or less than K_1, where

$$K_1 = 2\pi n_1/\lambda,$$

and

the thickness of each said substrate and said second coating of glass being at least about two times the thickness of said first coating of glass.

3,934,062

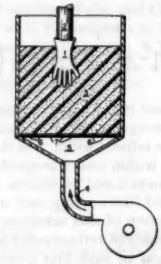
METHOD FOR COATING FABRICS FORMED INTO HAND GLOVES

Neil E. Tillotson, Dicksville Notch, N.H., and Sebastian A. Consoli, Lawrence, Mass., assignors to Tillotson Corporation, Needham, Mass.

Filed Dec. 6, 1972, Ser. No. 312,664. The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.

Int. Cl.² B44D *1/094*; **A41D** *19/00*

U.S. Cl. 427—185 **3 Claims**



1. A process for coating a yarn fabric with a thermoplastic resin which comprises:

impregnating the yarn of the fabric with a liquid plasticizer;

coating the impregnated fabric with a free-flowing solid thermoplastic resin powder which contains little or no plasticizer and which is capable of being plasticized by said plasticizer, said resin powder being selected from at least one of polyvinyl chloride, polyvinyl acetate, vinyl chloride-vinyl acetate copolymers and polyvinylidene chloride;

heating the resin to fuse the resin to said fabric,

said fabric being formed into a hand glove, including a plurality of fingers, to define an inside surface and an outside surface of said glove;

said fabric being contacted with said resin powder only on the outside surface of said glove;

said hand glove, in response to said impregnating, including a plurality of fingers impregnated with said plasticizer and wet therewith on said outside surface;

said free-flowing solid thermoplastic resin powder being provided by forming a fluidized mass of dispersed, solid thermoplastic resin powder; and

said coating being effected by

inserting said glove, while wet with said plasticizer, into said fluidized mass of solid thermoplastic resin powder with said fluidized mass providing dispersed, free-flowing solid resin powder beneath, between and laterally surrounding said fingers,

maintaining said glove inserted into said fluidized mass while said dispersed free-flowing solid thermoplastic resin powder thereof adhers to said wet, plasticizer impregnated outside surface of said glove,

withdrawing said glove out of said fluidized mass of dispersed, free-flowing solid thermoplastic resin powder with said solid resin powder adhering to said wet, plasticizer impregnated outside surface, and

the fluidized nature of said mass of solid thermoplastic resin powder effecting dispersion of said solid thermoplastic resin powder and facilitating said insertion of said glove into said mass of solid thermoplastic resin powder.

3,934,063

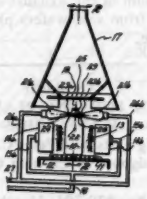
FLAME MASKING OF GLASS ARTICLES FOR METAL OXIDE FILM DEPOSITION

Roger D. Dubble, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed May 31, 1974, Ser. No. 475,288

Int. Cl.² B05D *3/08*, *1/32*

U.S. Cl. 427—223 **14 Claims**



1. A method of coating a selectively limited surface area of a glass article with an abrasion resistant metal oxide coating, comprising the steps of:

contacting the article with vapor of a metal compound which is pyrolysible to form an abrasion resistant metal oxide coating on the glass surface,

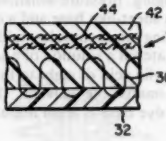
the said article during said contacting being at a temperature effective to cause said compound to pyrolyze on its surface and form said coating thereon, simultaneously isolating that portion of the article's surface area which is not to be coated, by a flame in which water vapor is produced as a product of combustion, the flame being directed on the article so that the flame acts as a barrier between the compound and the area not to be coated,

the flame barrier interacting with the compound, where the compound comes into contact with it, to deactivate the compound and render it inactive to react with said glass surface and thereby prevent said oxide coating from forming on the surface not to be coated.

3,934,064
COMPOSITE STRUCTURES OF KNITTED GLASS FABRIC AND THERMOPLASTIC POLYFLUOROETHYLENE RESIN SHEET

Edwin Doll Lowthian, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 201,862, Nov. 24, 1971, abandoned. This application Sept. 5, 1974, Ser. No. 503,464
Int. Cl.² B32B *17/02, 27/12*
U.S. Cl. 428—36 10 Claims

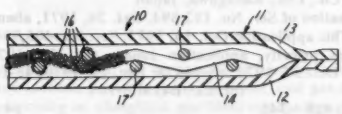


1. A composite structure comprising a substantially flat thermoformable sheet of a melt-fabricable perhalopolyfluoroethylene polymer resin and a knitted fabric made of glass fiber yarn and at least one monofilament of a melt-fabricable perhalopolyfluoroethylene polymer resin, said fabric being partially embedded in a surface of said sheet.

3,934,065
RETROREFLECTIVE SHEET MATERIAL

Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 1, 1973, Ser. No. 384,703
Int. Cl.² B44F *1/00*
U.S. Cl. 428—241 7 Claims



1. Retroreflective sheet material capable of reflecting under wet or dry conditions comprising (a) an envelope that comprises two overlaid sheets joined together around the edge of the envelope, at least one of the sheets being transparent, and (b) at least one light-transmissive retroreflective open web of filaments ensheathed within the envelope, the filaments being encased around their whole circumference at least over those parts of their length that define open spaces of the web by a monolayer of minute retroreflective microspheres.

3,934,066
FIRE-RESISTANT INTUMESCENT LAMINATES

Robert Matthews Murch, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed July 18, 1973, Ser. No. 380,386
Int. Cl.² B32B *3/26*
U.S. Cl. 428—248 21 Claims

1. An intumescent, fire retardant laminate system for application to a substrate to be protected from fire and heat comprising

a. an intumescent layer comprising at least one porous cellulosic sheet material selected from the group consisting of paper and fabric, impregnated with a water-soluble intumescent composition consisting essentially of
1. a heat-curable amino-aliphatic aldehyde condensation product as a resinous carbonific,
2. a non-resinous carbonific selected from the group consisting of carbohydrates and polyhydroxy alcohols, and
3. a spumific selected from the group consisting of monoammonium phosphate, di-ammonium phosphate, phosphoric acid, ammonium sulfate, ammonium bromide, sodium tungstate and mixtures thereof; and

b. a flexible, protective layer adhered to the outer surface of said intumescent layer, said protective layer being selected from the group consisting of organic thermoplastic resin layers and metallic foils.

2. A fire retardant laminate comprising:

a. an organic polymeric foam to be protected from fire and heat,

b. at least one intermediate barrier layer selected from the group consisting of a thermal barrier layer and a vapor barrier layer adhered to said foam, said thermal barrier layer consisting essentially of at least one heat insulative material that is thermally stable at least up to 200°C selected from the group consisting of mineral wool, glass wool, inorganic cements, expanded vermiculite, expanded perlite, wood, cardboard, cellulosic webs, and asbestos paper; and said vapor barrier layer consisting essentially of at least one vapor impermeable material that is thermally stable at least up to 200°C selected from the group consisting of metallic foils; and synthetic plastic films; and

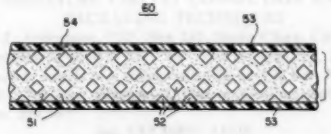
c. an intumescent layer adhered to said intermediate barrier layer, said intumescent layer comprising at least one porous cellulosic sheet material selected from the group consisting of paper and fabric, impregnated with a water-soluble intumescent composition consisting essentially of
1. a heat-curable amino-aliphatic aldehyde condensation product as a resinous carbonific,
2. a non-resinous carbonific selected from the group consisting of carbohydrates and polyhydroxy alcohols, and
3. a spumific selected from the group consisting of monoammonium phosphate, di-ammonium phosphate, phosphoric acid, ammonium sulfate, ammonium bromide, sodium tungstate and mixtures thereof; and

d. a flexible, protective layer adhered to the outer surface of said intumescent layer, said protective layer being selected from the group consisting of organic thermoplastic resin layers and metallic foils.

3,934,067
LAMINAR STRUCTURE HAVING AN IMPREGNATED FIBROUS WEB

Ira Bernard Goldman, Princeton Township, Mercer County, N.J., and John Francis Henrickson, Richmond, Va., assignors to Western Electric Company, Inc., New York, N.Y.

Filed July 17, 1974, Ser. No. 489,282
Int. Cl.² B32B *27/38, 15/08*
U.S. Cl. 428—290 4 Claims



1. A laminar structure comprising:

a. an internal skeleton comprising a fabric support impregnated with an epoxy-polyester resin product produced by interreacting (1) a branched-chain, acid-terminated polyester of dicarboxylic acid, dihydroxy alcohol and a polyfunctional compound selected from the class consisting of polyhydric alcohols having at least three nontertiary hydroxyl groups and polybasic acids having at least three carboxyl groups not more than one-half of the total of said acids and alcohols containing aromatic rings, which polyester contains an average of 2.1 to 3.0 carboxyl groups per molecule, has an acid number of 15 to 125, a hydroxyl number of less than 10, and is free from ethylenic unsaturation in its skeletal chain, and (2) an epoxy compound containing on the average at least 1.3 reactive groups readily reactive with the carboxyl group in said polyester, at least one of which reactive groups is the oxirane group, said reactive groups being separated by a chain of at least two carbon atoms, the chain being free from ethylenic unsaturation said epoxy-polyester product being in a stage of full cure, and

b a resin layer, on at least a portion of said internal skeleton, comprising said epoxy-polyester resin in (a) above cured to a partial cure stage.

3,934,068

GLASS FIBER REINFORCEMENT

Kevin M. Foley, Hebron; Francesco M. Vigo, Heath, and Frank Paul McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed July 24, 1974, Ser. No. 491,442

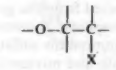
Int. Cl.² B32B *9/00, 25/20;* **D02G** *3/00*

U.S. Cl. 428—292 **16 Claims**

1. Glass fibers having a thin coating on the surfaces thereof, said coating comprising the reaction product of (1) a silicon halide having the general formula

$$(R)_n\ Si\ X_{4-n}$$

wherein R is an organic group containing ethylenic unsaturation, X is halogen and n is 0 or 1 with (2) an aliphatic epoxide containing 10 to 25 carbon atoms and about 1 epoxide group per mole, with the mole ratio of silicon halide to the epoxide being within the range of 3.8 to 4.5, said reaction product containing beta-haloalkoxy groups of the formula



wherein X is halogen, said beta-haloalkoxy groups being attached directly to the silicon atom through the oxygen atom.

3,934,069

NON-SMUDGING PRESSURE-SENSITIVE COPYING MATERIAL

Otto Atzrott, Ludwigshafen; Wolfgang Sliwka, Weinheim, and Heinz Hartmann, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 28, 1974, Ser. No. 484,081

Claims priority, application Germany, July 5, 1973, 2334227

Int. Cl.² B41M *5/00, 5/02*

U.S. Cl. 428—323 **11 Claims**

1. A non-smudging pressure-sensitive copying material which comprises: a sheet-like base and a coating on said base, said coating including microcapsules, said microcapsules containing as a core material a solution of a salt of a dye base and an aliphatic carboxylic acid of eight to thirty carbon atoms in an organic water-immiscible solvent, the ratio of organic carboxylic acid to dye base is from about 1:1 to equivalents.

3,934,070

RECORDING SHEET AND COLOR DEVELOPER THEREFOR

Shiro Kimura; Sadao Ishige, both of Kanagawa; Hajime Kato, Fujinomiya; Takao Hayashi, Fujinomiya, and Akio Miyamoto, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 192,594, Oct. 26, 1971, abandoned. This application Oct. 16, 1973, Ser. No. 406,994

Claims priority, application Japan, Oct. 23, 1970, 45-93247; Oct. 27, 1970, 45-94874; Dec. 10, 1970, 45-109872

Int. Cl.² B41M *5/16*

U.S. Cl. 428—342 **14 Claims**

1. A recording sheet comprising a support having coated thereon a color former layer containing an electron donating or proton accepting colorless color former and a color developer layer containing a zinc, aluminum or tin salt of an aromatic carboxylic acid having an OH-group at the ortho-position as a color developer capable of forming a distinct color when contacted with said color former.

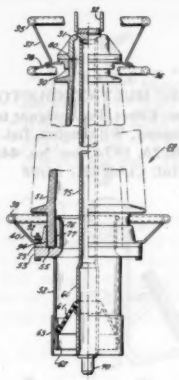
ELECTRICAL

3,934,071

AIR ENTRANCE BUSHING FOR GAS-INSULATED BUS

Vasu H. Tahiliani, New Stanton, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Oct. 22, 1974, Ser. No. 516,995
Int. Cl.² H01B 17/26; H02G 15/22
U.S. Cl. 174—31 R 6 Claims



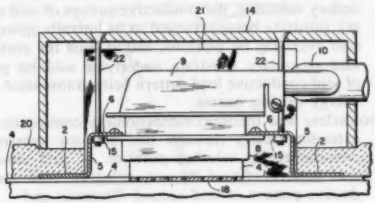
1. In combination, an air entrance bushing and a gas-insulated electric power transmission bus; said gas-insulated bus comprising an elongated, gas-filled conductive grounded housing having a given diameter, an elongated central bus conductor, and support means supporting said elongated central bus conductor within said housing; said bushing comprising a generally vertically disposed hollow elongated gas-filled insulation shell, a conductive flange ring connected to one end of said insulation shell, a central bushing conductor extending generally vertically along the axis of said insulation shell and having one end thereof fixed to the other end of said insulation shell; a hollow cylindrical extension secured at one end thereof to said conductive flange ring and being coaxial with said insulation shell; insulator support means mechanically connecting the opposite end of said hollow cylindrical extension to the opposite end of said bushing conductor; said insulator support means being disposed vertically below and being in communication with the interior volume of said insulation shell, whereby contamination particles within said insulation shell can fall onto and coat the surface of said insulator support means facing said interior volume; said hollow cylindrical extension, said conductive grounded housing and at least said one end of said insulation shell having substantially the same diameter; means coaxially connecting said opposite end of said hollow cylindrical extension to one end of said conductive grounded housing and forming a gas-sealed joint therebetween, and means connecting said opposite end of said bushing conductor to said elongated bus conductor; and an internal cylindrical member having one end fixed to and extending from said flange ring and having an outer diameter less than the opposing interior diameter of said insulation shell and less than the interior diameter of said hollow cylindrical extension and telescoping partly into said insulation shell to define a particle trap region.

3,934,072

APPARATUS AND METHOD FOR TERMINATING LINES RUNNING UNDER FLEXIBLE FLOOR COVERING

John William Balde, Raritan Township, Hunterdon County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,679
Int. Cl.² H02G 3/08, 3/10
U.S. Cl. 174—48 5 Claims



1. Apparatus terminating a line running along a floor underneath a flexible floor covering said apparatus comprising:

a. a plate having a peripheral flange extending around the perimeter thereof, said peripheral flange extending underneath said floor covering and over said line, said plate having an opening extending therethrough and adapted to receive from below the plate the line to be terminated, said opening having a first edge and an opposed second edge;

b. a first upstanding leg on said plate adjacent the first edge of said opening, said first leg being located inwardly of said peripheral flange;

c. a first flange on the upper end of said first leg extending partially over said opening toward the second edge thereof;

d. a second leg on said plate adjacent the second edge of said opening, said second leg being located inwardly of said peripheral flange;

e. a second flange on the upper end of said second leg extending partially over said opening toward the first edge thereof;

f. said first and second legs extending through an opening in said floor covering;

g. a connector mounted between said first and second flanges and connected to said line;

h. cover means mounted to said plate and concealing said opening and said first and second legs and said first and second flanges.

3,934,073

MINIATURE CIRCUIT CONNECTION AND PACKAGING TECHNIQUES

Frank J. Ardezzone, P.O. Box 242, Santa Clara, Calif. 93154

Continuation-in-part of Ser. No. 179,578, Sept. 10, 1971 now abandoned; which is a continuation-in-part of Ser. No. 1,929, Dec. 29, 1969, now abandoned. This application Sept. 5, 1973, Ser. No. 394,507
Int. Cl.² H02G 13/08
U.S. Cl. 174-52S 5 Claims

1. An interconnected semiconductor package, comprising: a semiconductor device having a plurality of pads on its

lower surface which are spaced inwardly from the edge thereof;

a substantially planar primary substrate having an upper and a lower surface and including a conductive lead pattern having tip portions corresponding to the configuration of pads on said device on its upper surface, at least the portions of said primary substrate underlying said tip portions being transparent to high energy welding beams;

a substantially planar secondary substrate having an upper and a lower surface and including a conductive pattern on its upper surface which is spaced from the edge thereof, the lower surface of said primary substrate being bondedly connected to the upper surface of said secondary substrate, the conductive pattern of said secondary substrate being arranged to be laterally spaced from said overlying tip portions, and at least the portions of said secondary substrate underlying said tip portions of said conductive lead pattern being transparent to high energy welding beams;

solderless and thermocompressionless connecting means extending solely through said primary substrate for interconnecting selected portions of said conductive lead pattern of said primary substrate with said conductive pattern of said second substrate; and

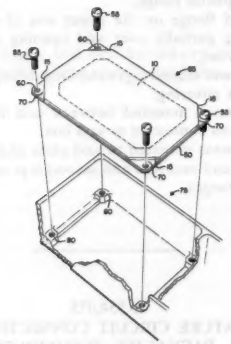
weld joints connecting the pads of said device to said tip portions of said conductive lead pattern of said primary substrate, whereby those pads connected to said selected portions of said lead pattern are interconnected through said conductive pattern of said secondary substrate.

3,934,074

CERAMIC CIRCUIT BOARD MOUNTED IN HOUSING AND METHOD OF FABRICATION THEREOF

Leon G. Evelove, Los Angeles County; John S. Leone, Orange County, and Don E. White, Los Angeles County, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 22, 1974, Ser. No. 462,850
Int. Cl.² H05K *5/00*
U.S. Cl. 174—52 R **23 Claims**



1. A ceramic circuit board structure, comprising:

a wafer of ceramic material, said wafer adapted to rigidly support electrical circuitry elements;

at least one metallic support member, at least a part of said support member being substantially planar, said part of said support member being rigidly secured to said wafer, at least a substantial portion of a surface of said part being in juxtaposition with at least a portion of a surface of said wafer, a portion of said member extending beyond the periphery of said wafer;

a rigid housing structure; and

mounting means selectively securing said support member to said housing structure, with no portion of said wafer being in contact with any portion of said mounting means or said housing structure to clarify the meaning of such phrase;

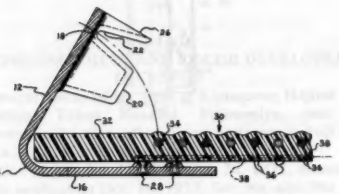
said support member being the sole support for said wafer.

3,934,075

CLIP FOR SHIELDED MULTICONDUCTOR FLAT CABLE

James John Dilliplane, Etters, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1974, Ser. No. 446,516
Int. Cl.² H02G *15/08*
U.S. Cl. 174—75 R **8 Claims**



4. In a shielded multiconductor flat cable, the improvement comprising a clip electrically interconnecting a shield and a conductor in the cable, comprising a pair of hingedly connected arms, one of the arms having means piercing the insulating material of the cable from one side and engaging a shield in the cable, and one of the arms having means piercing the insulating material from the opposite side of the cable and engaging a conductor in the cable.

3,934,076

MOISTURE PROOF CABLE SPLICE ENCLOSURE

Donald J. Smith, Woodland Hills, Calif., assignor to Smith-Schrerer & Assoc., Inc., Woodland Hills, Calif.

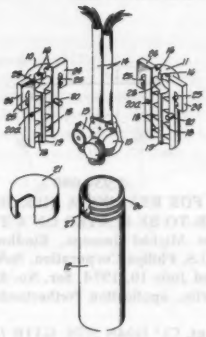
Continuation-in-part of Ser. No. 171,570, Aug. 13, 1971, abandoned. This application Nov. 17, 1972, Ser. No. 307,593
Int. Cl.² H02G *15/08*
U.S. Cl. 174—87 **11 Claims**

1. An enclosure for moisture proofing cable splices and cable ends associated therewith, comprising:

a vial, said vial having a mouth and an interior volume for accepting the cable splice;

a body of sealant contained in said vial for receiving the cable splice and the ends of the cables positioned in said vial;

a plug having means for accepting and rigidly fixing a plurality of cables relative to said plug in the immediate proximity for the cable splice, said plug fitting within and closing the mouth of said vial, said plug having a body capable of extending into said body of sealant thereby forcing said body of sealant to deform around said plug and cable ends to fill all passages leading from the enclosure, said plug comprising a plurality of mating elements positioned about said cables, said mating elements being provided with means for securely grasping said vial and said vial being provided with at least one circumferential ridge for cooperating with said grasping means of said mating elements.



4. A plug element for use in a cable splice enclosure, comprising:

a body portion having a plurality of central grooves formed therein for receiving cables, said grooves being separated by a ridge, said body portion further having a recess formed therein in a portion remote from said central groove;

a pair of arms extending outwardly from said body portion, each of said arms having a depending portion bearing a plurality of teeth directed toward said body portion; and

means on said body portion for aligning said element with a mating element.

3,934,077

VIEWING SYSTEM

Kenneth E. Wood; James T. O'Farrell, both of Annapolis; William F. Parrish, Baltimore, and Gordon M. Roesler, Annapolis, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1974, Ser. No. 482,189

Int. Cl.² H04N *1/38, 3/24*

U.S. Cl. 178—6 **11 Claims**

1. Apparatus for viewing a target area in a medium subject to backscatter, comprising:

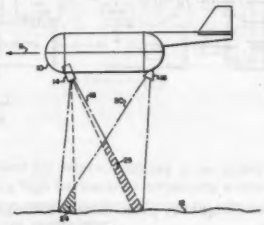
A. a TV camera adapted for movement relative to said target area;

B. means for illuminating at least a fixed portion of said target area in the field of view of said TV camera;

C. a TV monitor;

D. synchronizing generator means coupled to said TV camera and monitor for providing necessary operating signals;

E. circuit means for gating the same portion of the video



output of said TV camera during each TV frame during said movement and for displaying said portions on said TV monitor in juxtaposed positions;

F. said circuit means being operable to move said displayed portions on said TV monitor corresponding to movement of said TV camera relative to said target area;

G. said gated video output being indicative of scene information from an area of reduced backscatter.

3,934,078

KEY GENERATING SYSTEM

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1946, Ser. No. 666,281

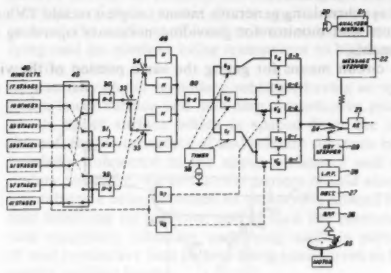
Int. Cl.² H04L *9/04*

U.S. Cl. 178—22 **10 Claims**

1. In a key pulse generating circuit for producing key pulses varying in amplitude in highly irregular manner, said pulses occurring at a given rate, means to generate high speed off-on pulses at a rate many times higher than said given rate in a plurality of separate paths, means to hold over certain of said off-on pulses into subsequent of said high speed pulse times, means to combine the pulses so held over with pulses subsequently generated in certain of said paths to form combination of said high speed pulses, and means to select and combine with one another to form one of the final key pulses occurring at said given rate, individual ones of said last-mentioned high speed pulses occurring at instants of time separated from one another by several of said high speed pulses while discarding the intervening high speed pulses.

6. A pulse producing system comprising an initial portion operating at high frequency and a subsequent portion operating at low frequency, means to generate irregularly occurring pulses at high frequency in said initial portion, means in said subsequent portion to produce low frequency pulses each having a time period great enough to include many successive high frequency pulse periods, including means for selecting from among said high frequency pulses a plurality or pulses all occurring at different non-overlapping times within one low frequency pulse period and separated from one another in

time by a plurality of high frequency pulse periods, and means to combine each such plurality of selected pulses into a single



resultant low frequency pulse in said subsequent portion of said system.

3,934,079

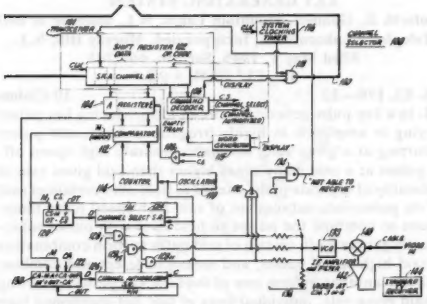
BILATERAL COMMUNICATIONS SYSTEM FOR DISTRIBUTING COMMERICAL AND PREMIUM VIDEO SIGNALING ON AN ACCOUNTABLE BASIS

Andrew Wayne Barnhart, Dresher, Pa., assignor to Jerrold Electronics Corporation, Horsham, Pa.

Filed Oct. 26, 1973, Ser. No. 409,820

Int. Cl.² H04N *1/44*

U.S. Cl. 178—5.1 **29 Claims**



1. In combination, subscriber terminal means for selectively displaying one of plural video programs supplied thereto, each of the plural video programs occupying a differing, prescribed frequency allocation, a plural stage channel select shift register, means for loading a selected stage of said shift register with a predetermined binary character, for selecting a particular one of said plural video programs for viewing, a plural stage channel suthorization shift register, means for loading said channel authorization shift register to enable reception of selected of said plural video programs, plural coincidence logic means each connected to a differing, associated pair of the outputs of one of said channel select shift register stages and one of said channel authorization shift register stages, and video selection means responsive to the outputs of said coincidence logic means for selectively enabling reception of a particular one of the plural video programs wherein said subscriber terminal means includes channel selector, channel control, and subscriber control modules, each of said modules including a data transceiver, data bus interconnecting means for serially-loop connecting the transceivers in each of said channel control, subscriber control and channel selector modules, each of said modules including means for loading digital messages into the transceiver there contained and means for extracting messages therefrom, and means for serially propagating messages around the digital transmission loop comprising said module transceivers and

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3,934,080

APPARATUS FOR READING A DISK-SHAPED RECORD CARRIER TO BE PLAYED ON A TURNTABLE

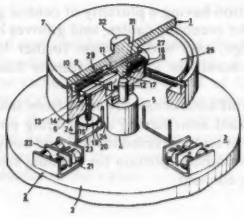
Peter Johannes Michiel Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,904

Claims priority, application Netherlands, Feb. 28, 1974, 7402767

Int. Cl.² H04N *5/76*; G11B *17/02*

U.S. Cl. 178—6.6 R **24 Claims**



1. An apparatus for reading a disk-shaped record carrier to be placed on a turntable, on which record carrier signals are stored in substantially circular tracks, which apparatus comprises a driven rotary shaft, a frame disposed on said rotary shaft, an electrical measuring system means for measuring the eccentricity of the tracks and for supplying a control signal corresponding to said eccentricity, at least two movable transmission elements which are drivable in mutually different directions, each transmission being movably connected to the frame, an electromagnetic drive means connected to each transmission element and to said electrical measuring system means for actuating said transmission elements in response to said control signals, first resilient means for biasing said transmission elements against said turntable, and at least one additional resilient element being disposed between the drive means and the transmission element, said resilient element coupling the motion of said electromagnetic drive means to said transmission element.

3,934,081

METHOD AND APPARATUS FOR IMPROVING PHOTOMECHANICAL REPRODUCTION BY CONTRAST DECREASE

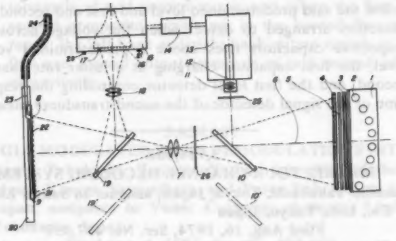
Ernst E. Schumacher, Gruneburgweg 129, 6 Frankfurt am Main, Germany

Filed Apr. 1, 1974, Ser. No. 456,605

Claims priority, application Germany, Mar. 31, 1973, 2316273

Int. Cl.² H04N 7/18

U.S. Cl. 178—6.8 7 Claims



1. A method for reproducing black and white transparent copy and improving photomechanical reproduction thereof by contrast decrease comprising the steps:

a. Optically directing the projection of a main positive video image of the transparent copy along a first optical axis through a first process lens onto a first video-imaging plane,

b. Photographically recording said main positive video-image on a light-sensitive emulsion placed on said first video-imaging plane,

c. Optically directing the projection of a secondary positive video-image along a second optical axis onto the second imaging plane of a television camera lens,

d. Converting the secondary positive video-image therefrom on the photo-cathode of the picture tube in said TV camera to an electronic signal,

e. Electronically amplifying said electronic signal output from the TV camera in an amplifier,

f. Electronically inverting the amplified electronic signal from the amplifier so received to a negative electronic signal on an electronic signal image inverter,

g. Converting the negative electronic signal output from the electronic image inverter to a secondary negative video-image on the plane telescreen of the picture tube of a television monitor having optoelectronic image contrast and brightness control,

h. Optically directing the projection of the secondary negative video-image so contrasted and brightened through a second process lens onto the first video imaging plane in register with the main positive video-image thereon, and

i. Photographically recording said negative and positive video-images in mutually reciprocal registry on said light-sensitive emulsion.

3,934,082

POST DETECTION DEVICE FOR ELIMINATING BACKSCATTER

Alan Gordon, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 12, 1974, Ser. No. 496,598

Int. Cl.² H04N 7/18

U.S. Cl. 178—6 2 Claims

1. In a method for remote viewing in an underwater environment having high backscatter employing a television camera, illumination means displaced from said television camera, the improvement comprising:

causing the raster lines of said television camera to extend in a vertical direction at right angles to the direction of displacement of said illumination source from said television camera;

filtering the output of said television camera to prevent the passage of low frequencies; and

causing the raster lines of a monitor receiver effectively connected to said television camera to extend in the same direction as those of the camera, whereby backscatter from the illumination source is effectively reduced.

3,934,083

METHOD AND APPARATUS FOR PROCESSING THE INFORMATION CONTENT OF A PATTERN DRAWING IN CODED FORM

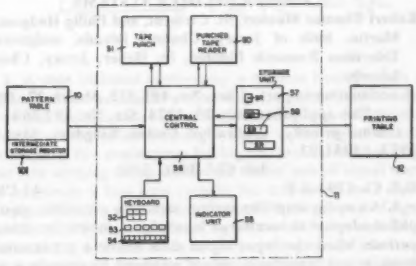
Ernst Dieter Plath, Tailfingen, Germany, assignor to Mayer & Cie., Tailfingen, Germany

Continuation-in-part of Ser. No. 342,623, March 19, 1973, abandoned. This application May 10, 1973, Ser. No. 359,262

Claims priority, application Germany, Mar. 25, 1972, 2214787

Int. Cl.² H04N 5/76

U.S. Cl. 178—6.6 R 8 Claims



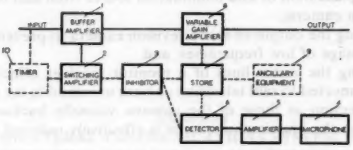
1. A method for processing the information content of a pattern drawing in coded form in preparation for application

of said content to a utilization device wherein the information of each discrete portion of a line of the pattern includes a unique characteristic such as color, which comprises the steps of scanning each line of the drawing in stepwise fashion so as to scan successive discrete areas in each line, illuminating and projecting each of said scanned areas of each line in succession upon a projection screen for observing the unique characteristics of said succession of areas, entering the unique characteristics of a scanned area then in registration with a prescribed location on the screen into the lowest order stage of a shift register that has a plurality of stages less than the number of discrete areas of each line of the pattern drawing, and selectively clearing the register and simultaneously outpulsing all the information stored therein when the register is filled and when the scanning of a line of the pattern drawing is complete.

3,934,084
VARIABLE GAIN AMPLIFIER CONTROLLED BY AMBIENT NOISE LEVEL

Robert Thomas Munson, St. Peter, and Philip Hodgson, St. Martin, both of Jersey, Channel Islands, assignors to Television Research Limited, St. Helier, Jersey, Channel Islands

Filed Mar. 27, 1974, Ser. No. 455,373
Int. Cl.² H03G 1/02
U.S. Cl. 179—1 VL **4 Claims**



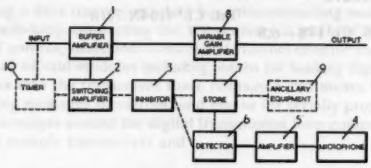
1. An audio amplifier system comprising a variable gain amplifier adapted to receive an input signal and produce an output audio signal therefrom in a signal processing channel, threshold means for detecting periods when the input singal falls below a predetermined level, sound transducer means arranged to provide a noise audio signal proportional to the sound level in the area or a part thereof covered by the system developing a gain control audio signal and gain control means connected for controlling the gain of said variable gain amplifier with said gain control signal, inhibitor means controlled by the threshold means connected to prevent the change of the gain of the variable gain amplifier in response to said noise signal except during periods when the input signal falls below the said predetermined level, a timer arranged to mute the input to the variable gain amplifier at predetermined intervals and further comprising means for resetting the timer each time the input signal falls below the said predetermined level.

3,934,085
AUDIO AMPLIFIER SYSTEMS

Robert Thomas Munson, St. Clement, and Philip Hodgson, St. Martin, both of Jersey, Channel Islands, assignors to Television Research Limited, St. Helier, Jersey, Channel Islands

Continuation-in-part of Ser. No. 455,373, March 27, 1974. This application July 29, 1974, Ser. No. 492,864
Claims priority, application United Kingdom, Mar. 28, 1973, 14951/73
Int. Cl.² H03G 3/00
U.S. Cl. 179—1 P **11 Claims**

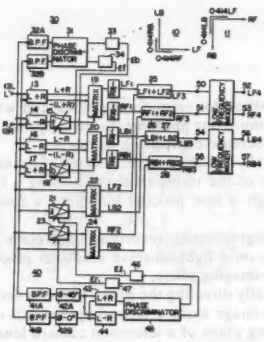
1. An audio amplifier system including a variable gain amplifier adapted to receive an input signal, means for detecting periods when the input signal falls below a predetermined level, sound transducer means arranged to provide a signal proportional to the ambient noise level in the area or a part thereof covered by the system for therewith controlling the gain of the amplifier, and inhibitor means controlled by said detecting means to prevent the change of the gain of said variable gain amplifier except during periods when the input signal falls below said predetermined level, wherein the sound transducer means comprises signal detecting means whose response time is short at the beginning of each said period and increases for the remainder thereof, and wherein the said latter signal detecting means comprises first and second capacitors arranged to be charged when the input signal falls below the said predetermined level and first and second level detectors arranged to detect when the voltage across the respective capacitors rises above a predetermined voltage level, the first capacitor charging at a faster rate than the second, and the first level detector controlling the response time of the signal detector of the sound transducer means.



3,934,086
MATRIX FOUR-CHANNEL DECODING SYSTEM

Susumu Takahashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1974, Ser. No. 497,959
Claims priority, application Japan, Aug. 20, 1973, 48-93097
Int. Cl.² H04R 5/00
U.S. Cl. 179—1 GQ **3 Claims**



1. In a matrix four-channel decoding system for converting first and second composite signals encoded with at least left-front, right-front, left-back and right-back directional audio input signals in preselected amplitude and phase relationships into left-front, right-front, left-back and right-back output signals, comprising matrix means for producing said output signals by combining said first and second composite signals, and means for detecting the level relationship between the directional audio input signals contained in said first and second composite signals and controlling said matrix means so as to produce said output signals while varying the mixing coefficients of said first and second composite signals in accordance with the instantaneous amplitude relationship between said directional audio input signals,

said matrix four-channel decoding system comprising

first and second mixers each having first and second input terminals and first and second output terminals,

said first mixer being connected to receive the left-front and right-front output signals from said matrix means at said

first and second input terminals of said first mixer, respectively, for developing, when the first and second composite signals are in a first frequency range, a sum of the left-front and right-front output signals which is substantially a sum of the first and second composite signals at each of said first and second output terminals of said first mixer, and, when the first and second composite signals are in a second frequency range above the first frequency range, the left-front and right-front output signals at said first and second output terminals of said first mixer, respectively, and

said second mixer being connected to receive the left-back and right-back output signals from said matrix means at said first and second input terminals of said second mixer, respectively, for developing, when the first and second composite signals are in the first frequency range, a difference of the left-back and right-back output signals which is substantially a difference of the first and second composite signals at each of said first and second output terminals of said second mixer, and, when the first and second composite signals are in the second frequency range, the left-back and right-back output signals at said first and second output terminals of said second mixer, respectively.

3,934,087

ANGLE MODULATED WAVE DEMODULATION SYSTEM

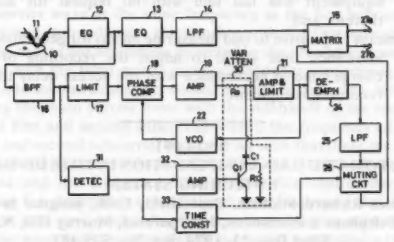
Nobuaki Takahashi, Yamato; Yoshiki Iwasaki, Yokohama; Masao Kasuga, Sagamihara, and Yasuo Itoh, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 4, 1973, Ser. No. 403,635

Claims priority, application Japan, Oct. 7, 1972, 47-100300; Oct. 9, 1972, 47-101451

Int. Cl.² G11B *3/04*

U.S. Cl. 179—100.4 ST **4 Claims**



1. A system for demodulating an angle modulated wave signal which is included in a multiplex of signals reproduced from a multichannel record disc on which the multiplex of an angle modulated wave signal and a direct wave signal are recorded, said system comprising:

separator means responsive to the reproduced mutliplex of signals for individually separating the angle modulated wave signal and the direct wave signal from the reproduced multiplex of signals;

phase locked loop means comprising voltage controlled oscillator means; phase comparator means for generating an output signal representing a phase difference detected responsive to a comparison of the phase of the carrier wave of the separated angle modulated wave signal with the phase of a signal generated by said voltage controlled oscillator means; variable attenuation means responsive to the output signal of said phase comparator means foor variably attenuating audio frequency components in the output signal of said phase comparator means more than frequency components in the output signal which have frequencies that are lower than the audio frequencies so that the attenuation quantity of the audio frequency components is varied corresponding to an attenuation control signal applied thereto, the output signal of said variable attenuation means being a demodulation of the angle modulated wave signal; said voltage controlled oscillator means changing the frequency responsive to a part of the output signal of said variable attenuation means of the generated signal to follow the frequency of the carrier wave;

whereby said phase locked loop means has a first lock range within which the oscillation frequency of said voltage controlled oscillator means follows the frequency deviations of the carrier wave which are lower than the audio frequencies and a second lock range which is narrower than the first lock range and within which the oscillation frequency of said voltage controlled oscillator means follows the audio frequency deviations of the carrier wave and which second lock range is varied corresponding to the attenuation control signal;

detecting means responsive to the angle modulated wave signal separated by said separator means for detecting the envelope of the separated angle modulated wave signal to produce an output signal;

phase-inverting means responsive to the output signal of said detecting means for producing a phase-inverted output signal; and

rectifier means for rectifying the phase-inverted output signal to provide said control signal;

said variable attenuation means being responsive to the control signal from said rectifier means for varying the attenuation quantity of the audio frequency components corresponding to the level of the output signal of said rectifier means.

3,934,088

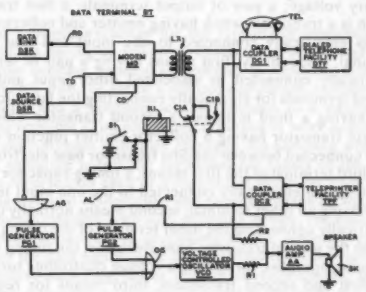
DATA TERMINAL FOR CONNECTION TO TELEPHONE OR TELEPRINTER FACILITIES

Francis C. Marino, Dix Hills, N.Y., assignor to Redactron Corporation, Hauppauge, N.Y.

Filed June 13, 1974, Ser. No. 479,051

Int. Cl.² H04M *11/00, 11/02*

U.S. Cl. 179—2 DP **2 Claims**



1. A data terminal comprising: a modem having a pair of signal transfer terminals, a data output terminal, a data input terminal, and a carrier output terminal for giving an indication when the modem is receiving a signal at the signal transfer terminals; a line transformer having first and second windings, said first winding being connected to said pair of signal transfer terminals; a first data coupler for connection to a dialed telephone facility, said first data coupler having a pair of signal transfer terminals, one of said signal transfer terminals being connected to one end of the second winding of said line transformer; a second data coupler for connection to a teleprinter facility, said second data coupler having a pair of signal transfer terminals, one of said signal tranfer terminals being connected to said one end of the second winding of said line

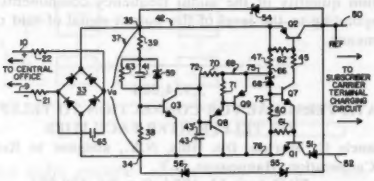
transformer, and having a ring indicating terminal for emitting a signal when the teleprinter facility sends a ringing signal; a switch means having switching means for alternately connecting the other signal transfer terminal of said first data coupler or said second data coupler to the other end of the second winding of said line transformer, and having output means for giving an indication when said first data coupler is connected across the second winding of said line transformer; and a signalling means comprising first means for giving an indication that a call between the data terminal and the dialed telephone facility is ended when the carrier output terminal of said modem is not giving an indication while the output means of said switch means is giving an indication that said first data coupler is connected across the second winding of said line transformer, and second means for giving a different indication upon receipt of a signal from the ring indicating terminal of said second data coupler.

3,934,089

AUTOMATIC DISCONNECT CIRCUIT FOR SUBSCRIBER CARRIER TELEPHONE SYSTEM

James A. Stewart, Menlo Park, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 31, 1974, Ser. No. 519,719
Int. Cl.² H04H *1/08*
U.S. Cl. 179—2.5 R **24 Claims**



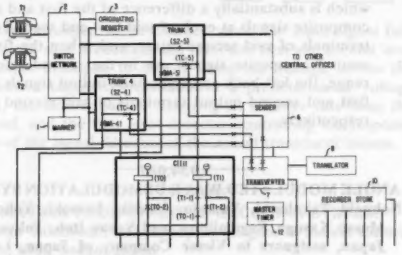
1. In a disconnect circuit for a remote terminal in a subscriber carrier telephone system wherein the circuit has a pair of input terminals electrically connected to a central office battery voltage; a pair of output terminals; a first transistor which is a transistor switch having emitter and collector electrodes electrically connected to one input and one output terminal, respectively; first means having a pair of terminals electrically connected to associated other input and other output terminals for electrically connecting the latter together and having a third terminal; a second transistor which is a control transistor having a collector-emitter junction electrically connected between the first transistor base electrode and the third terminal of the first means; a timing capacitor having one terminal electrically connected to the one input terminal and having an other terminal; second means normally directly electrically connecting the other terminal of the timing capacitor to the second transistor base electrode, the timing capacitor being operative for storing a voltage controlling turn-on of the first and second transistors; third means for resistively coupling drive current from the other input terminal for application to the base electrode of the second transistor for selectively enabling the latter transistor and the first transistor to conduct and for charging the timing capacitor; and fourth means responsive to a prescribed voltage condition produced across the input terminals for selectively discharging the timing capacitor; the improvement wherein said second means comprises: fifth means for selectively bypassing away from the second transistor base electrode a constant current portion of the drive current from the third means and selectively passing it to the capacitor for charging the latter, and for bypassing away from the second transistor and the capacitor a variable portion of the drive current from the third means during charging of the capacitor to maintain a constant charge current to the capacitor during charging of the latter; at least part of the current from the third means that is passed by said fifth means during charging of the capacitor being passed by the second transistor when the charge voltage on the capacitor is sufficient to cause the voltage between the second transistor base electrode and the first transistor emitter electrode to exceed a threshold voltage related to conduction of the second transistor.

3,934,090

TELEPHONE MESSAGE TIMING SYSTEM

Robert Bartlett Curtis, and Nelson Andrew Riedel, both of Columbus, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1974, Ser. No. 516,624
Int. Cl.² H04M *15/18*
U.S. Cl. 179—7.1 R **10 Claims**



1. In a switching system wherein call charging times are recorded for usage of a communication facility and wherein the times recorded are subject to adjustment to allow for delay in accessing recording equipment, the combination comprising

means for measuring an interval of time since the recording equipment was last idle with no request for access thereto, and

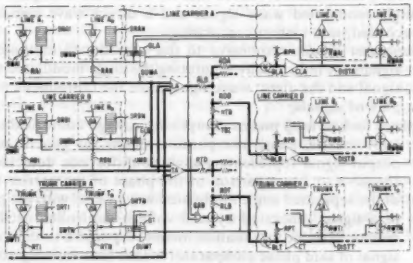
means responsive to said measuring means for generating an allowance time signal to adjust the recording of the charge time in accordance with the access delay to the recording equipment.

3,934,091

AUTOMATIC GAIN COMPENSATION IN TIME DIVISION SWITCHING SYSTEM

James Richard Stidham, Broomfield, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1974, Ser. No. 535,487
Int. Cl.² H04J *3/02*
U.S. Cl. 179—15 AT **8 Claims**



1. In a time division switching system in which port circuits served by different summing buses as well as port circuits served by the same summing bus may be interconnected by circuitry providing a specified amount of gain comprising

amplifier means for increasing the gain to port circuits when the port circuits involved on a connection are served by the same summing bus, and

switchable attenuation means for decreasing the gain when the port circuits involved on the connection are served by different summing buses.

3,934,092

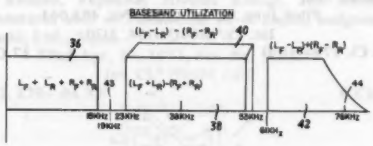
FOUR CHANNEL STEREOPHONIC BROADCASTING SYSTEM

Antal Csicsatka, Utica, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Continuation-in-part of Ser. No. 182,318, Sept. 21, 1971, abandoned. This application Dec. 1, 1972, Ser. No. 311,195

Int. Cl.[2] H04H 5/00

U.S. Cl. 179—15 BT 31 Claims



1. A system capable of transmitting and receiving a broadcast signal containing four discrete stereophonically related audio frequency inputs including a transmitter and one or more receivers, wherein the transmitter comprises matrix means responsive to said four inputs for producing four matrix outputs each of which is a function of at least one of said inputs, means for generating a main carrier wave, means for frequency modulating the main carrier wave with the first matrix output, means for generating a first subcarrier wave, means for amplitude modulating the first subcarrier wave with the second matrix output, means for generating a second subcarrier wave at the same frequency as the first subcarrier wave and in quadrature relationship with the first subcarrier wave, means for amplitude modulating the second subcarrier wave with the third matrix output, means for suppressing the first and second subcarrier waves, means for frequency modulating the main carrier wave with the sidebands of the modulated first and second subcarrier waves, the frequency of the first and second subcarrier waves being such that there is a gap between the lower sidebands of the first and second subcarrier waves and the frequency band of the first matrix output, means for generating a pilot signal at a frequency that falls within said gap, means for frequency modulating said main carrier wave with the pilot signal, means for generating a third subcarrier wave at a frequency above that of the first and second subcarrier waves, means for amplitude modulating the third subcarrier wave in accordance with the fourth matrix output, means for depressing or suppressing the third subcarrier wave, means for reducing the amplitude of the modulation of the third subcarrier wave to a maximum level below the highest level that would exist in the absence of such a reducing operation, filter means for removing all but a relatively small portion of the upper sideband of the third subcarrier wave and for attenuating the uppermost portion of the lower sideband of the third subcarrier wave, a time equalizer means for equalizing the travel time of signals of different frequencies that pass through the filter means, and means for frequency modulating the main carrier wave with the remaining portions of the sidebands of the modulated third subcarrier wave, the frequency of the third subcarrier wave being such that the lower sideband of the third subcarrier wave is separated from the upper sidebands of the first and second subcarrier waves; and each receiver comprises means responsive to the pilot signal for regenerating and reinserting the first, second, and third subcarrier waves, means for detecting the four matrix outputs, and de-matrix means responsive to the four matrix outputs for reproducing said four discrete audio frequency inputs.

3,934,093

TRANSIT EXCHANGE FOR ASYNCHRONOUS DATA WITH UNKNOWN STRUCTURE

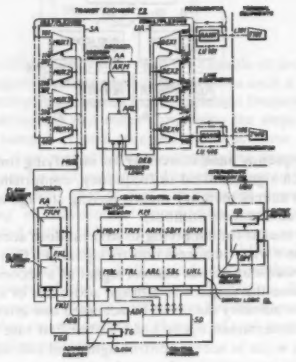
Per-Olof Thyselius, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed July 24, 1974, Ser. No. 491,298

Claims priority, application Sweden, Aug. 10, 1973, 73109704

Int. Cl.[2] H04J 3/00

U.S. Cl. 179—15 BA 8 Claims

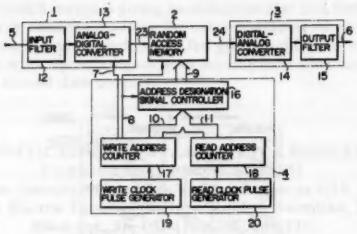


1. In a transit exchange for the relaying of asynchronous data signals having an unknown character structure and data rate from sending terminal equipments to receiving terminal equipments with the aid of a control equipment, containing a computer, and a sampling means, common to a number of sending terminal equipments and arranged to work according to the time division multiplex principle, for sampling with the aid of sampling pulses the instantaneous values of the data signals received on each of a number of incoming lines from sending terminal equipments, and encoder means arranged to work synchronously with said sampling device, for encoding by means of successive processing of the sampling pulses whether the data signals have changed said value between two consecutive sampling pulses and, in correspondence therewith, for delivering an indication signal in the form of a code word having a specific number of binary bits which indicate the time position for the sampling pulse occurring after such change, the improvement comprising an intermediate memory means for storing the data bits serially in an addressed location assigned to the receiving terminal equipment, a decoding means connected to said intermediate memory for successively processing the binary bits to form indication signals which alter their value in accordance with the time position indicated by the code words, regeneration means assigned to receiving terminal equipments, and a read-out means arranged to work synchronously with said decoding means, for transferring the values of the indication signals cyclically from said decoding means to said regeneration means, and said regeneration means including means for forming from the values of the received indication signals data signals which change value in synchronism with the indication signals.

3,934,094
FREQUENCY BAND CONVERTER

Masaharu Kobayashi, Hachioji; Tsuneji Koshikawa, Sayama, and Toshio Tanizoe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 27, 1973, Ser. No. 391,846
Claims priority, application Japan, Aug. 28, 1972, 47-85368
Int. Cl.² H04J 7/00
U.S. Cl. 179—15.55 T 5 Claims



1. A frequency band converter for modifying time and pitch of a speech signal shifted in frequency, comprising:

random access memory means having storage addresses of a predetermined number;

control means for supplying to said random access memory means a write-in access control signal at a first rate as well as a read-out access control signal at a second rate so as to cause the respective storage addresses of said random access memory means to be accessed one after another in a predetermined cyclic order at the first rate in response to the write-in access control signal and also at the second rate in response to the read-out access control signal, respectively, one of the first and second rates being different and variable with respect to the other, said control means giving precedence to one of the write-in and read-out access control signals with respect to the other only when both said write-in and read-out access control signals are concurrently supplied to said random access memory means;

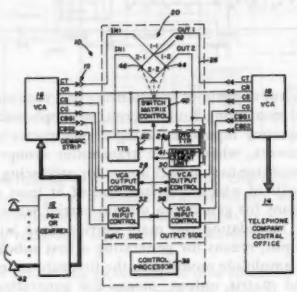
input means for receiving the frequency shifted speech signal and for intermittently writing sampled pieces of information of the frequency shifted speech signal in the respective storage addresses of said random access memory means which are accessed only in accordance with the write-in access control signal in the predetermined cyclic order at the first rate despite interchangeable access of the storage addresses of said random access memory means in accordance with the read-out access control signal so that each of the storage addresses of said random access memory means accessed in accordance with the write-in access control signal stores one sampled piece of information which is replaced with another sampled piece of information applied to the same address after cyclic access of said random access memory means; and

output means for intermittently reading out the pieces of information stored in said random access memory means from the storage addresses of said random access memory means which are accessed only in accordance with the read-out access control signal in the predetermined cyclic order at the second rate despite interchangeable access of the storage addresses of said random access memory means in accordance with the write-in access control signal, whereby the sampled pieces of information of the frequency shifted speech signal are successively written in said storage addresses of the random access memory means one after another by said input means independently of the reading operation of the thus stored piece of information from said storage addresses of the random access memory means one after another by said output means such that pieces of information read out by the output means are periodically discarded from the pieces of information stored when the first rate is faster than the second rate or pieces of information read out by the output means are periodically repeated in the pieces of information stored when the first rate is slower than the second rate, each discard or repetition being limited at most to the sampled pieces of information stored in the addresses of only one cyclic order.

3,934,095
METHOD AND SYSTEM FOR SHORT TERM QUEUING OF TELEPHONE CALLS IN AUTOMATIC INTER-CITY TELEPHONE CALL CONNECTION SYSTEM

Gordon H. Matthews, and Barry M. Epstein, both of Dallas, Tex., assignors to Action Communication Systems, Inc., Dallas, Tex.

Filed June 24, 1974, Ser. No. 483,061
Int. Cl.² H04Q 3/64, 3/70
U.S. Cl. 179—18 D 17 Claims



1. A system for automatically controlling the connection of telephone calls between a user's dedicated telephone switching facility having a plurality of user terminals and a plurality of flat rate output telephone lines extending to a central office comprising:

means for receiving user authorization code numbers from said user terminals,

means for generating a tone signal only if said authorization code numbers meet a predetermined criterion,

means responsive to dialing signals from the authorized user terminals for selecting the most economical available one of said flat rate output telephone lines in accordance with a predetermined ranking of said flat rate telephone lines according to economy of use,

means for connecting, when flat rate output telephone lines are available, the authorized user terminals with the selected flat rate output telephone lines extending to said central office for completion of the dialed telephone calls, and

means for generating an audio message to the caller when no flat rate output telephone lines are available, said audio message requesting the caller to hold for a predetermined time interval during which the call is automatically connected if a flat rate output telephone line becomes available.

12. A method of controlling the connection of inter-city telephone calls between a plurality of input telephone lines at a user's facility and a plurality of leased output telephone lines extending to a central office comprising:

receiving a service request signal from the user's facility on one of said input telephone lines,

detecting dialing signals from the input telephone line,

selecting the most economical one of said leased output telephone lines for completing the dialed call in accordance with a predetermined ranking of said telephone

lines according to economy of use and establishing a voice connection through said input telephone line through the selected leased output telephone line,

if no leased output telephone lines are available, generating an audio message to the caller via the input telephone lines requesting the caller to hold for a predetermined time interval,

if a leased output telephone line becomes available during the predetermined time interval, transmitting representations of the received dialing signals to the available leased output telephone line to establish connection with the desired called location through the central office, and

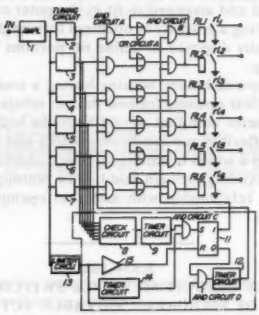
operating a switch matrix to connect the calling input telephone line with the available output telephone line.

3,934,096

MULTI-FREQUENCY SIGNAL RECEIVING CIRCUIT

Goro Kusano, Fujisawa; Hiroshi Kosugi, and Yasuhiro Yamamura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 27, 1973, Ser. No. 355,276
Int. Cl.² H04M 1/00
U.S. Cl. 179—84 VF 6 Claims



1. A multi-frequency signal receiving circuit having an input signal amplifier, a plurality of frequency detectors each including a tuning circuit for generating an output in response to a signal of selected frequency received from the output of the input signal amplifier, and output circuit means connected to the outputs of said frequency detectors for controlling the transmission of the received signal, which comprises:

check circuit means connected to said frequency detectors for detecting the existence of a predetermined number of outputs of said frequency detectors and for generating an output only when a predetermined number of outputs are detected;

first timing circuit means connected to the output of said check circuit means for delaying the transmission of the output thereof;

rectifying circuit means connected to the output of said input signal amplifier for cnverting the received signal energy to a direct-current signal;

second timing circuit means connected to the output of said rectifying circuit means for delaying the transmission of the output thereof;

first AND gate means connected to said first and second timing circuits and operating when simultaneously receiving the outputs of said first and second timing circuit means; and

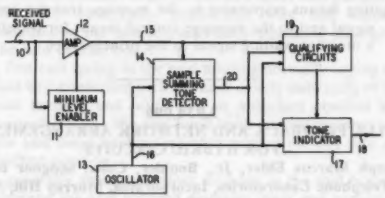
control means operating in response to the output of said AND gate means for controlling the transmission of the received signal in said output circuit means.

3,934,097

MULTIFREQUENCY TONE DETECTION

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1974, Ser. No. 496,695
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF 16 Claims



1. In a multifrequency tone receiver capable of detecting in a received signal any one of m different tones each a superposition of n component signals having different frequencies, the method of detecting said tones comprising the steps of:

taking a sample of said received signal at some arbitrary starting time and at subsequent sampling times delayed therefrom by half-periods and combinations of half-periods of different ones of said commponent signals,

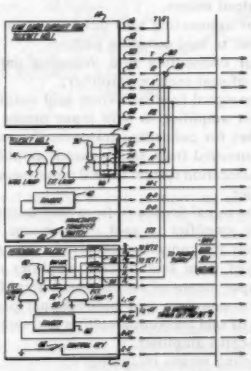
performing m independent summations each summation associated with a different one of said tones, and including the starting time sample and 2^n-1 additional samples delayed therefrom by half-periods and combinations of half-periods of the frequencies comprising the corresponding tone, the one summation having approximately zero value corresponding to the one of said tones present in the received signal.

3,934,098

TELEPHONE MESSAGE TRANSFER CIRCUIT

George A. Merritt, Jr., Tustin, Calif., assignor to San/Bar Corporation, Santa Ana, Calif.

Filed Apr. 1, 1974, Ser. No. 457,116
Int. Cl.² H04M 1/64
U.S. Cl. 179—84 C 9 Claims



1. In a telephone system in which an attendant telephone set monitors the calls received by a plurality of principal telephone sets and transfers a message waiting signal to any selected one of the principal sets, the attendant set having means for seizing the line conductors associated with any of the

principal sets, and further having message control means for providing a message waiting signal to any selected principal set, the improvement of a message transfer circuit individually connected between each principal set and the attendant's set, each transfer circuit comprising:

means responsive to the seizure of the line conductors of the associated principal set by the attendant set for providing a message transfer enabling signal; and

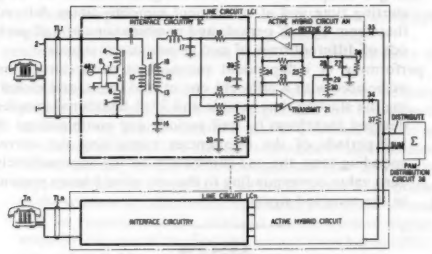
gating means responsive to the message transfer enabling signal and to the message control means for transferring a message waiting signal to the principal set.

3,934,099

BIAS, FEEDBACK AND NETWORK ARRANGEMENTS FOR HYBRID CIRCUITS

Joseph Marcus Elder, Jr., Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1974, Ser. No. 498,056
Int. Cl.² H04M *9/08*; H04B *1/58*
U.S. Cl. 179—170 NC **20 Claims**



1. A hybrid circuit for coupling an incoming and an outgoing path to a bidirectional path in a communication system and comprising

a transmit and a receive amplifier each having input means and output means,

means for connecting said output means of said transmit amplifier to said outgoing path,

means for connecting said incoming path to said input means of said receive amplifier,

means for signal feedback from said output means of said transmit amplifier to said input means of said receive amplifier for cancelling transmitted communication signals conveyed from said transmit amplifier through said communication system to said input means of said receive amplifier,

means for signal feedback from said output means of said receive amplifier to said input means of said transmit amplifier for cancelling received communication signals conveyed from said receive amplifier output means to said input means of said transmit amplifier, and

means for coupling said bidirectional path to said input means of said transmit amplifier and said output means of said receive amplifier,

said coupling means including

first and second capacitors,

a transformer having a first winding connected to said bidirectional path in series with said first capacitor and a second winding connected in series with said second capacitor and

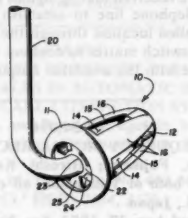
means connected to said second capacitor and deriving signal feedback from said second capacitor to said input means of said transmit amplifier.

3,934,100

ACOUSTIC COUPLER FOR USE WITH AUDITORY EQUIPMENT

Mas Harada, Minneapolis, Minn., assignor to Seeburg Corporation, Chicago, Ill.

Filed Apr. 22, 1974, Ser. No. 462,814
Int. Cl.² H04R *1/10*
U.S. Cl. 179—182 R **5 Claims**



1. An acoustic coupler for use with a sound carrying tube directed into the outer ear, said coupler comprising:

a. an elongated and tapered bulb-like hollow housing constructed and arranged to fit in the outer ear of a wearer and having a plurality of openings formed therein circumferentially disposed to define rib portions in said hollow housing;

b. said tapered hollow housing having a small end portion with a first opening formed therein substantially smaller in diameter than that of said bulb-like hollow housing;

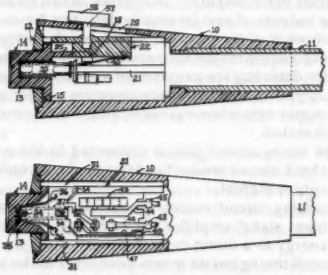
c. and a flexible conduit having a first end adapted to be fitted to a sound transmitting device and having a second end extending through said hollow housing into acoustic sealing relationship with said first opening in said end portion.

3,934,101

MULTIPLE CIRCUIT MULTIPLE SWITCH HAVING A PAIR OF MANUALLY MOVABLE ACTUATING ELEMENTS

Wesley C. Jones, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jan. 20, 1975, Ser. No. 542,506
Int. Cl.² H01H *9/26*, *13/70*, *15/08*
U.S. Cl. 200—5 B **8 Claims**



1. An electrical switch having an elongated tubular dielectric housing providing an open end and a partially open top including

a. means within the housing providing a plurality of spaced electrical conductors positioned beneath the open top and in longitudinal alignment with the open end of the housing,

b. a first and second switch actuator movable in the same plane through the housing and into circuit-making contact with said plurality of electrical conductors,

c. circuit-making contacts carried by said first and second actuators and movable therewith over and into contact with said plurality of electrical conductors,

d. means provided by said first actuator in contact with said second actuator for moving said second actuator in one direction through the housing,

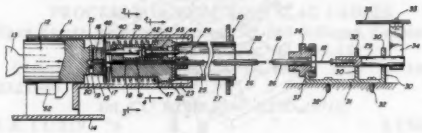
e. means provided by said second actuator for moving said second actuator in either direction through the housing independently of the movement of said first actuator,

f. and means for yieldably maintaining said second actuator in a selected position as it is moved independently by said moving means and by movement of said first actuator over and into contact with certain of said plurality of electrical conductors.

3,934,102
AUTOMOTIVE VEHICLE IGNITION LOCKING AND HOOD LATCHING APPARATUS

Charles P. Barcik, Westchester, and Joseph J. Gagliardo, Chicago, both of Ill., assignors to Auto-Sentry Co., Chicago, Ill.

Filed Feb. 18, 1975, Ser. No. 550,469
Int. Cl.² H01H 27/00
U.S. Cl. 200—44 **2 Claims**



1. A combination automotive vehicle ignition system locking and hood latching apparatus comprising:

a. a generally cylindrical housing adapted to be mounted on the frame of an automotive vehicle and having

1. an axially outer end portion;

b. a key-controlled lock cylinder slidably mounted in the said axially outer end portion of the said housing and having

1. a reduced diameter axially inner end portion;

c. a central body slidably mounted in the said housing axially inwardly of the said key-controlled lock cylinder; and having therein

1. a first axially extending passage;

d. a hood latch control member slidably mounted in the said first axially extending passage in the said central body and having

1. an inner end portion attached to the said reduced diameter axially inner end portion of the said key-controlled lock cylinder, and having

2. an outer end portion extending axially outwardly of the said housing;

e. a hood latching member carried by the said outer end portion of the said hood latch control member and adapted to latchingly engage a hood latching member mounted on the inner surface of the hood of the said automotive vehicle when the said hood latch control member and the said hood latching member carried thereby are in outwardly extended position;

f. a second axially extending passage in the said central body and having slidably mounted therein

1. an electrically conductive member including

a. an inner end portion having thereon

b. a first electrically conductive contact head;

g. the said electrically conductive wire member having

1. an outer end portion to be electrically connected to an instrumentality in the ignition system of the said automotive vehicle, and having

2. an inner end portion projecting into the said housing and into the said second axially extending passage in the said central body, and having thereon

3. a body of electrically insulating material;

h. a second contact head on the said inner end portion of the said electrically conductive wire and slidably mounted in the said second axially extending passage in the said central body;

i. a first coil spring in the said housing normally urging the said key-controlled lock cylinder axially outwardly of the said housing and into open or unlocked position and normally urging the said hood latch control member and the said hood latching member carried thereby into unlatched position;

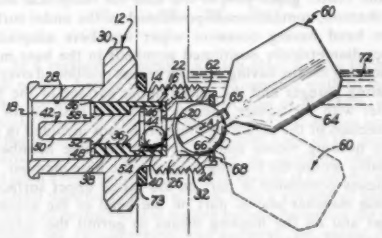
j. a generally annular retainer member in the said housing between the said reduced diameter inner end portion of the said key-controlled lock cylinder and the said first coil spring and adapted to engage the said first coil spring and the said first contact member when the said key-controlled lock member is manually moved axially inwardly in the said housing;

k. a second coil spring in the said second axially extending passage in the said central body and surrounding the said inner end portion of the said electrically conductive wire and normally urging the said second contact head on the said inner end portion of the said electrically conductive wire into electrical contacting engagement with the said first contact head on the said electrically conductive member.

3,934,103
LIQUID LEVEL SENSING SWITCH

Hidde Walstra, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 3, 1974, Ser. No. 475,468
Int. Cl.² H01H 35/18
U.S. Cl. 200—84 C **9 Claims**



1. A liquid level sensing switch comprising an electrically conductive body having a chamber open at one end, electrical contact means, electrically insulating means mounting said contact means within said chamber in electrically insulated relation to said body with one end of said contact means in spaced relation to said body within said chamber and with an opposite end of said contact means extending from said chamber, an electrically conductive magnetizable ball movable within said chamber between a closed circuit position engaging said contact means and body and an open circuit position spaced from one of said contact means and body, a float mounted on said body exteriorly of said chamber for movement between first and second positions in response to change in level of a liquid to which said float is exposed, and magnet means movable with said float exteriorly of said chamber for moving said ball between said open and closed circuit positions within said chamber in response to movement of said float between said first and second positions exteriorly of said

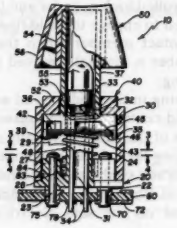
chamber, said body having a bore at one end forming said chamber and having a bore at an opposite end forming a socket, said bores being separated by a wall portion of said body between said bores, said float having a ball portion at one end secured in said socket for permitting pivotal movement of said float on said body and having a bouyant portion at its opposite end to be exposed to a liquid, and said magnet means being mounted in said ball portion of said float.

3,934,104

PUSH-BUTTON SWITCH

Glenn M. Stout, 2000 Argonne Drive, Minneapolis, Minn. 55422

Filed Sept. 23, 1974, Ser. No. 508,228
Int. Cl.² H01H *13/50*
U.S. Cl. 200—159 R **19 Claims**



1. A push-button electric switch comprising, a base member having a lower surface adapted to rest on a circuit board, said base member having a center guide post and a raised upper surface with contact terminals positioned in said raised upper surface and extending through the base member being exposed on the upper surface, an actuating plunger having a head symmetrical with the raised upper surface of the base member and a hollow shaft section adapted to be positioned over the center guide post of the base for reciprocal movement thereon, contact means positioned on the under surface of the head having common wiper members adapted to contact diametrically positioned terminals in the base member, housing means having a center recess positioned over the acturating plunger and the raised upper surface of the base member with the center opening providing passage for the shaft section of the actuating plunger, means included in part on the housing means and in part on the base member to releasably secure the housing means to the base member, and key means positioned in part on the raised upper surface of the base member and in part on the head of the actuating plunger and on the housing means to permit the actuating plunger to be rotated a predetermined rotation with respect to the base member and bring the contact means on the head of the plunger into engagement and selectively with two pair of diametrically positioned terminals in the base member.

3,934,105

MINIATURE SWITCH WITH LIGHTED INDICATOR

Joseph Larue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 468,321, May 9, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 540,784
Int. Cl.² H01H *3/12*
U.S. Cl. 200—317 **3 Claims**

1. A momentary optical signal switch, for plugging into a printed circuit board, comprising:

a base,

a cover on said base,

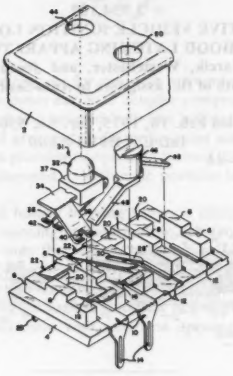
a plurality of electrical contacts mounted in opposed rows along said base,

light emitting diodes having pairs of resilient electrical leads, said diodes being mounted in rows in said cover,

said pairs of leads resiliently bridging across and engaging first corresponding opposed pairs of said contacts,

an array of push buttons mounted in rows in said cover and having corresponding pairs of resilient fingers engaged on said base for resiliently biasing said push buttons to project outwardly from said cover,

said push buttons overlying second corresponding opposed pairs of said contacts and momentarily connecting second



corresponding opposed pairs of contacts upon displacement of said pushbuttons toward said base, and

said rows of contacts projecting from said base for pluggable connection to electrical circuit means to enable bridging one of said first opposed pairs of contacts in series with one of said second opposed pairs of contacts, thereby to complete an electrical circuit through a corresponding diode as a corresponding push button is displaced to momentarily connect a second corresponding opposed pair of contacts.

3,934,106

MICROWAVE BROWNING MEANS

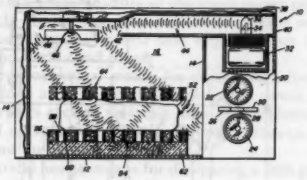
George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

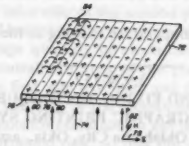
Division of Ser. No. 395,469, Sept. 10, 1973, Pat. No. 3,857,009. This application Aug. 14, 1974, Ser. No. 497,445
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 E **3 Claims**

1. A utensil for microwave heating comprising:

a base member having regions of alternately high and low dielectric constant characteristics to provide a fringing

electric field pattern having a substantially 180° phase differential adjacent to a surface of said member when





exposed to radiating free space electromagnetic wave energy.

3,934,107

PROCESS FOR REPAIRING SLAG LADLES

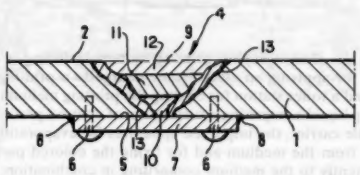
Egon Evertz, Varlander Strasse, 23, 565 Solingen, Germany

Filed Apr. 23, 1974, Ser. No. 463,422

Claims priority, application Germany, May 2, 1973, 2321946

Int. Cl.² B23K 9/04; B22D 19/10

U.S. Cl. 219—76 5 Claims



1. A process for repairing slag ladles, used in the production of iron and steel, which are damaged by thermal and chemical stresses, comprising the steps of: first securing a suitably sized steel plate to the exterior of the ladle over the damaged area; forming a homogeneous joint with the steel plate within the ladle by building up a first welded layer by means of steel electrodes; welding on at least one further layer using steel electrodes and cast iron electrodes simultaneously; and finally, welding on at least one layer using cast iron electrodes so that, in all, the filling formed by the layers is at least equal to the original thickness of the slag ladle at the location occupied by the layers.

3,934,108

LEAD BONDING METHOD AND APPARATUS

Norman A. Howard, Cupertino, Calif., assignor to Uthe Technology, Inc., Sunnyvale, Calif.

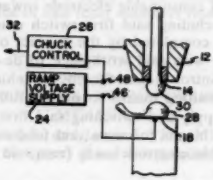
Filed Sept. 16, 1974, Ser. No. 506,245

Int. Cl.² B23K 11/10

U.S. Cl. 219—85 7 Claims

5. An improved lead bonding method of the type wherein a segment of electrically conductive wire is extended through a capillary tool having a bonding surface and is mechanically bonded by the capillary tool along different portions of its length to separate circuit points; wherein the improvement comprises the steps of

placing the length of wire in contact with a heat sink adjacent the bonding surface of the capillary tool and



producing an electric current of such shape and magnitude in a portion of the wire between the capillary tool and a select one of the circuit points to which the wire is bonded so as to resistively heat the wire portion and rupture it, forming integral balls on the ends of the wire at the capillary tool bonding surface and the circuit point.

3,934,109

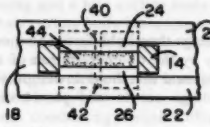
LATCH PIVOT FOR LATCH NEEDLE

Richard W. Shepard, and Albert S. Ashmead, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 265,706, June 25, 1972, Pat. No. 3,850,011. This application Feb. 7, 1974, Ser. No. 440,459

Int. Cl.² B23K 27/00

U.S. Cl. 219—121 LM 4 Claims



1. In a method of forming a latch pivot for the latch of a latch needle, having portions of the opposite walls of the slot in the needle displaced into a pivot hole of the latch, with a space between the displaced portions and with spaces separating the latch from each of the opposite walls of the slot, the improvement comprising the steps of: applying controlled heat from a high energy heat source against at least one of said displaced wall portions to at least melt a portion of said displaced wall portion so that molten metal is formed in the space between the two displaced wall portions; the extent of the molten metal being controlled to substantially fill said space without contacting the latch and allowing the molten metal to solidify to fuse the displaced wall portions together without changing the spaces separating the latch from each of the opposite walls of the slot.

3,934,110

WELDING SYSTEM AND METHOD FOR ARC STARTING AND CONTROL

Albert P. Denis, 2050 Brookview Road, Castleton, N.Y. 12033

Filed Mar. 11, 1974, Ser. No. 449,829

Int. Cl.² B23K 9/12

U.S. Cl. 219—131 F 2 Claims

1. In a welding system including a welding power supply and an electrode feed motor, said power supply being adapted to be connected across a workpiece and a consumable electrode which is driven toward or away from said workpiece by said feed motor, the system for arc starting and control comprising:

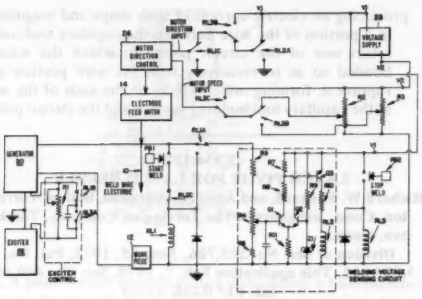
means for initiating a welding operation,

first switch control means energized by said initiating means,

switchable voltage limiting means in said power supply and controlled by said first switch control means to limit the output of said power supply,

first switchable motor direction means controlled by said first switch control means for causing said feed motor to drive said consumable electrode toward said workpiece,

a circuit including said first switch control means which circuit is completed by the contact of said consumable electrode with said workpiece to de-energize said first switch control means thereby switching said switchable voltage limiting means to permit full output from said power supply and switching said first switchable motor direction means to cause said feed motor to drive said consumable electrode away from said workpiece,



a switchable voltage threshold device connected across said power supply by the de-energization of said first switch control means, said threshold device providing an output when the voltage across said power supply reaches a preset value,

second switch control means energized by the output of said threshold device,

second switchable motor direction means controlled by said second switch control means for causing said feed motor to drive said consumable electrode toward said workpiece, and

switchable motor speed means controlled by said second switch control means for causing said feed motor to feed said consumable electrode at a preset rate corresponding to the burn off rate.

3,934,111

APPARATUS FOR HEATING A WINDOW

Sergio Roselli, Pisa, Italy, and Gerd Sauer, Aachen-Laurensberg, Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

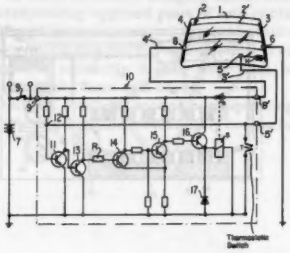
Filed Feb. 15, 1974, Ser. No. 442,831

Claims priority, application France, Feb. 16, 1973, 73.05468

Int. Cl.² H05B *1/02*; E06B *7/12*

U.S. Cl. 219—203 **9 Claims**

1. Apparatus for heating a vehicle window comprising a plurality of heating conductors applied to the window, a switch for connection of said conductors to a source of electrical energy, first means to close said switch in response to the presence of water at a first location adjacent the window, and second means at a second location to close said switch, independently of the operation of said first means, upon appearance of a temperature below a specified value at said second location, wherein said second location is inside the vehicle at a region sheltered from the space heater of the vehicle and



which reflects the temperature existing in the vicinity of said window.

3,934,112

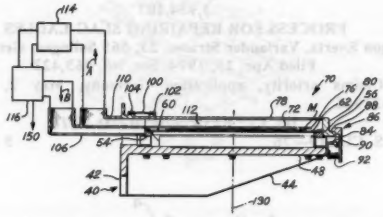
DRYING AND FIXING TECHNIQUES FOR ELECTROGRAPHIC PRINTING SYSTEM

Kishor M. Lakhani, Oklahoma City, Okla., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 4, 1974, Ser. No. 447,700

Int. Cl.² H05B *1/00*; G03G *15/00*

U.S. Cl. 219—216 **21 Claims**



1. In an electrographic printing system including a print station for applying an electrostatic charge to a printing medium and a toner station for coating the printing medium with a toning liquid comprising a suspension of colored particles in a volatile carrier, the improved apparatus for evaporating the carrier from the medium and for fixing the colored particles permanently to the medium comprising in combination:

chamber means for defining a chamber having an inlet port and an opposed exit port;

means for moving the printing medium into the inlet port and out of the exit port in a predetermined direction at a predetermined speed;

platen means for supporting the printing medium in the chamber between the inlet port and the exit port, said platen means being substantially bisected by a first plane parallel to the predetermined direction and by a second plane perpendicular to the first plane, an inlet edge on the inlet side of the second plane adjacent the inlet port, an exit edge on the exit side of the second plane adjacent the exit port, a first side edge extended between the inlet edge and the exit edge on a first side of the first plane and a second side edge extending between the inlet edge and the exit edge on a second side of the first plane opposite the first side;

first electrical heater means for dissipating a first predetermined average quantity of electrical power per unit of area in a first side inlet area of the platen means located adjacent the first side edge between the inlet edge and the second plane;

second electrical heater means for dissipating a second predetermined average quantity of electrical power per

unit of area in a first side exit area of the platen means located adjacent the first side edge between the exit edge and the second platen;

third electrical heater means for dissipating a third predetermined average quantity of electrical power per unit of area in a second side inlet area of the platen means located adjacent the second side edge between the inlet edge and the second plane;

fourth electrical heater means for dissipating a fourth predetermined average quantity of electrical power per unit of area in a second side exit area of the platen means located adjacent the second side edge between the exit edge and the second plane;

fifth electrical heater means for dissipating a fifth predetermined average quantity of electrical power per unit of area in a central inlet area of the platen means located between the first side inlet area and the second side inlet area on the inlet side of the second plane;

sixth electrical heater means for dissipating a sixth predetermined average quantity of electrical power per unit of area in a central exit area of the platen means located between the first side exit area and the second side exit area on the exit side of the second plane; and

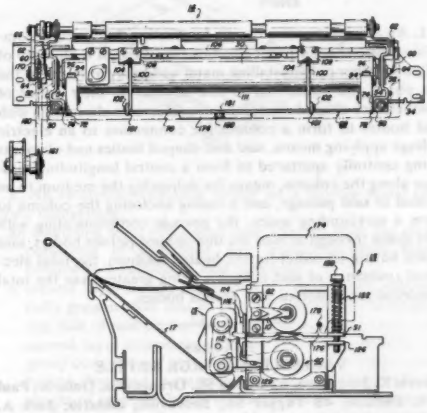
circulation means for circulating a gas through the chamber at a predetermined rate, so that the vaporization rate of the carrier from the printing medium is maximized by the heater means and the concentration of carrier vapor in the chamber is maintained below a predetermined value by the circulation means.

3,934,113

ROLL FUSER APPARATUS AND MOUNTING ARRANGEMENT THEREFOR

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 24, 1974, Ser. No. 482,677
Int. Cl.² H05B *1/00*; **B21B** *27/06*
U.S. Cl. 219—216 **9 Claims**



1. Fuser apparatus and support means therefor comprising:

a base member having a substantially planar portion;

means including a first pair of support brackets rigidly affixed to said base member;

a first fuser member supported only adjacent the ends thereof by said means including a first pair of support brackets;

means including a second pair of support brackets;

a second fuser member supported only adjacent the ends thereof by said means including a second pair of support brackets and independently of said first fuser member;

means for pivotally attaching said second pair of brackets to said first pair of brackets, said attaching means being disposed to one side of said fuser members adjacent the ends thereof;

said fuser members forming a nip through which copy sheets to be fused are moved, said nip being disposed intermediate said means for pivotally attaching said pairs of brackets; and

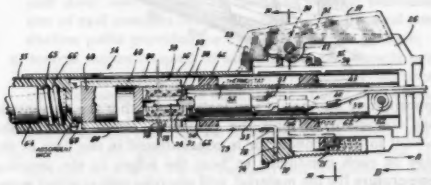
means for applying pressure contact between said fuser members, said pressure apply means being disposed to the opposite side of said fuser members from said attaching means.

3,934,114

HAIR STYLING DEVICE HAVING VAPOR GENERATING MEANS

Siegfried Godel, Norwalk, and James J. Viola, Milford, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 20, 1974, Ser. No. 481,215
Int. Cl.² H05B *1/00*; **A45D** *1/02*, *2/36*
U.S. Cl. 219—222 **7 Claims**



1. An electric hair curling iron including means for selective generation of liquid vapors for styling the hair of the user therewith, comprising:

a. a handle casing and a hair curling body extending therefrom, said hair curling body including a heating chamber therein having openings in communication with an exterior surface of said body,

b. stationary heat generating means arranged in said handle casing and said body,

c. movable heat conducting means within said body disposed to receive heat from said stationary heat generating means,

d. liquid storage means spaced from said handle casing and at one end of said hair curling body and including liquid transfer means in communication with the liquid storage means,

e. said liquid transfer means being spaced from said movable heat conducting means to define therebetween a vaporization space within said heating chamber, said openings communicating with said vaporization space and

f. actuator means carried by the handle casing and operably associated with said movable heat conducting means for selectively bringing said movable heat conducting means into and out of engagement with said liquid transfer means to effect generation of vapors from the liquid in the liquid transfer means, whereby, vapors are formed in said vaporization space and pass exteriorly through said openings in the hair curling body.

3,934,115

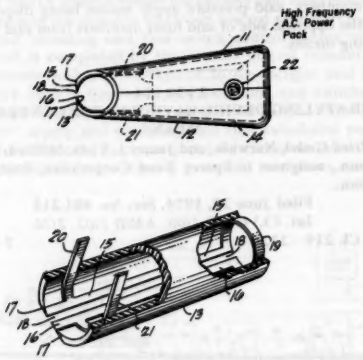
METHOD AND APPARATUS FOR ELECTRIC SINGE CUTTING

Gerald H. Peterson, 650 Bush, San Francisco, Calif. 94108

Filed Sept. 25, 1973, Ser. No. 400,595
Int. Cl.² H05B *3/02*; **B26D** *7/10*
U.S. Cl. 219—223 **5 Claims**

1. The method of severing a thin material by the application of sufficient heat along a line on each of the opposite sides of said material in back-to-back relationship to sever such material along a line, that comprises inserting said material be-

tween two elongated, closely spaced strip electrical conductors, each having in opposition to the other a narrow edge, causing to travel along each of said conductors a high frequency current exhibiting in such travel the skin effect, and said edges of said conductors being sufficiently close enough together and the electron travel of each said currents being



opposite one another at any instant such that the currents in said conductors exhibit the proximity effect whereby the current in each conductor is concentrated in the face of the edge of each conductor to heat the edges to the severing temperature for the material, and whereby said inserted material will be severed along such line by the heat generated along and between such opposed narrow edges.

3,934,116

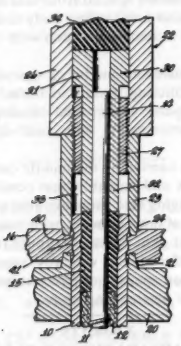
ELECTRIC HEATER ASSEMBLIES

Donald M. Cunningham, Pittsburgh, and Ralph Santoro, Verona, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 427,823, Dec. 26, 1973, Pat. No. 3,859,721. This application Oct. 23, 1974, Ser. No. 517,366

Int. Cl.² H05B *1/00, 3/78;* **F24H** *1/00*

U.S. Cl. 219—336 **4 Claims**



1. An electric heating element, comprising:

a metal tube,

a resistance member within said tube and insulating material within said tube to electrically insulate said resistance member from said tube,

a pair of metal terminal pins, each having one end within a respective tube end and mechanically and electrically connected to a respective end of said resistance member and having an opposite end extending outwardly of the respective tube end,

a metal mounting member for attaching said heating element to the wall of a container, said mounting member having a hole through which one end of said tube passes with close tolerance,

means holding said tube one end within said mounting member hole and providing a sealing connection therebetween, said means including metal deformation adjacent to said tube end and the surface defining the hole in said mounting member, and an elastomeric bushing closely fitting within said tube one end and closely around the terminal pin thereat, said bushing being locked within said tube one end under axial compression.

3,934,117

ELECTRIC FLUID HEATING DEVICE

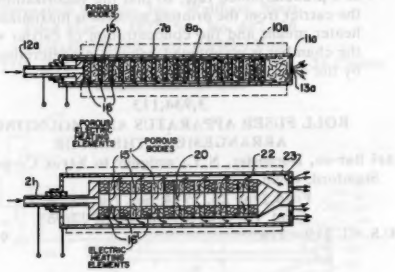
Hermann J. Schladitz, Plantschweg 74, Munich, Germany

Filed Mar. 21, 1974, Ser. No. 453,497

Claims priority, application Germany, Mar. 27, 1973, 2315268

Int. Cl.² H05B *3/10;* **F24H** *1/10*

U.S. Cl. 219—382 **3 Claims**



1. An electric heating device for heating fluid media, comprising; disc-shaped porous bodies consisting of a plurality of felted together polycrystalline metal whiskers grown out of the gas phase and connected to one another at their points of contact, disc-shaped electric heating elements alternating with said bodies to form a column for connection to an electric voltage applying means, said disc-shaped bodies and elements being centrally apertured to form a central longitudinal passage along the column, means for delivering the medium to be heated to said passage, and a casing enclosing the column to form a surrounding space, the passage communicating with said space through at least the disc-shaped porous bodies, said space having an outlet for the heated medium, the total electrical resistance of said elements being greater than the total electrical resistance of said porous bodies.

3,934,118

VARIABLE WATTAGE KETTLE

Morris E. Jorgenson, 67 Bythia St., Orangeville, Ontario; Paul B. Sheldon, 48 Tupper St., Brockville, Ontario; Jack A. Sherman, 23 Forest Park, and Peter S. Wardell, 63 Rustic Crescent, both of Orangeville, Ontario, all of Canada

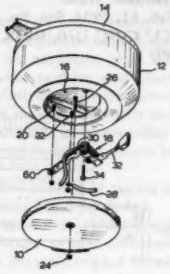
Filed June 27, 1974, Ser. No. 483,892

Int. Cl.² F27D *11/02*

U.S. Cl. 219—442 **1 Claim**

1. An electric kettle comprising a covered metallic vessel having a lid sealedly attached thereto, said lid having a handle and spout formed integrally therein, a cavity formed in the lower surface of said vessel for housing a thermostatic device, said vessel having a sheath type heater sealedly mounted in the bottom of said vessel to heat water in said vessel, the ends of said heater passing in a sealed relation through the lower surface of said vessel into said cavity, a power supply cord also being supplied to said cavity, said cavity being covered by an

insulating base plate, said power supply cord being connected in a circuit comprising said heater and said thermostatic device, said thermostatic device being mounted in good heat transfer relationship with the lower surface of said vessel so as



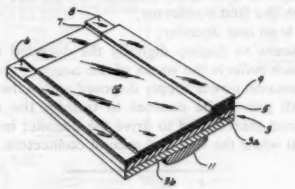
to sense the temperature of water in said vessel, said thermostatic device having handle means extending through said base plate so as to enable the operating temperature range of said thermostatic device to be conveniently adjusted from the exterior of said base plate.

3,934,119

ELECTRICAL RESISTANCE HEATERS

George Trenkler, East Providence, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 17, 1974, Ser. No. 506,680
Int. Cl.² H05B 3/16
U.S. Cl. 219—543 7 Claims



1. An electrical resistance heater on a flexible metal substrate comprising:

an insulating layer of a cured resin selected from the group consisting of polyimide and polyamide-imide resins bonded to a surface of said substrate;

a second layer having an electrical conductivity substantially greater than that of said insulating layer bonded at one side of said second layer to said insulating layer, said second layer comprising a cured resin selected from the group consisting of polyimide and polyamide-imide resins having dispersed therein at least approximately 60% by weight of graphite flakes, said second layer having spaced portions electrically connectable in an external electrical circuit for directing electrical current through said second layer; and

at least one electrically conductive stripe bonded to one of said spaced portions of said second layer for providing flexible electrical connection of said one portion of said second layer in said external electrical circuit, said stripe comprising a cured resin selected from the group consisting of polyimide and polyamide-imide resins having dispersed therein flakes of a conductive metal;

said layers being flexible and said second layer and stripe having electrical conductivities which are not substantially degraded during operation at temperatures of at least 200°C. for extended periods of time.

3,934,120

DEVICE FOR ELECTROCONDUCTIVE CONNECTION AND READING

Nikolay Maymarev, 15, Kyrkogatan, Sundbyberg, Sweden (S-172 32)

Filed July 18, 1973, Ser. No. 380,468
Claims priority, application Sweden, July 21, 1972, 9601/72
Int. Cl.² G06K 7/06, 19/06
U.S. Cl. 235—61.11 A 12 Claims

1. A data storage and retrieval memory device comprising:

a. at least one exchangable sheet of material which is electrically substantially non-conductive having a plurality of conductive paths and a plurality of data storage positions on at least one side, each data storage position defined by a gap between two conductive paths, at least one individual conductive path being provided for each data position, each data position adapted to be individually coded by the application on selected positions of marking material which is electrically substantially conductive;

b. a stationary pad on which said sheet is removably supported in overlying relationship having first means with a plurality of contacts for releasably engaging said side of said sheet said contacts including at least an individual one of said contacts contacting each said individual conductive paths provided for each data storage position;

c. second means coupled to said plurality of contacts providing an electrical readout device for sensing the presence and absence of said marking material at each of said data storage positions while said sheet is stationary on said stationary pad and said contracts are stationary; and

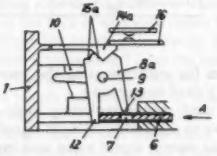
d. wherein said gaps defining data storage positions are located so as to be visibly exposed and available for coding even during sensing to permit a user to make marks closing said gaps using a conductive material as well as to open the gaps by removal of said material and can correlate marks on said sheet with a response of said electrical readout device by a visual inspection of said gaps.

3,934,121

COUNTER MEANS

Kurt Kratt, Aldingen; Josef Gruler, Aixheim; Guenther Hauser, Trossingen, and Reinhard Irion, Aldingen, all of Germany, assignors to J. Hengstler K.G., Aldingen, Germany

Filed July 12, 1974, Ser. No. 488,177
Claims priority, application Germany, July 18, 1973, 2336544
Int. Cl.² G06K 7/04, 19/06
U.S. Cl. 235—61.6 R 7 Claims



1. Counter means for a counting of events which comprises:

a counter;

a code detector adapted to receive a coded punched card in a pre-determined position; and

counter control means operable to control said counter in response to the arrival of said card to said predetermined position;

said code detector comprising replaceable, pivoted code detector elements, which represent a pre-determined code and are adapted to enter holes in said punch card, if, and only if, said holes also represent said pre-determined code;

said code detector preventing movement of said card to said pre-determined position unless said code detector elements had entered said holes in said card;

said code detector comprising further a plastics material structure which carries resilient holders, said resilient holders disposed on opposite ends of said code detectors and formed with locating slots which said code detector elements snap in said slots and the axis of said code detector elements in pre-determined positions corresponding to said pre-determined code;

said plastic material structure designed to guide said card as it is moved toward said pre-determined position and carrying spring detents adapted to cooperate with said code detector elements to yieldably hold each code detector element in different angular positions;

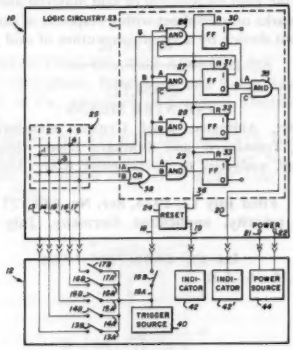
said code detector element provided with peripheral notches and stub shafts located at its opposite ends; with each of said slots forming a bearing for rotatably mounting one of said stub shafts with its axis in a predetermined position; and

said spring detents adapted to enter said notches to yieldably hold said code detector elements in their angular position.

3,934,122
ELECTRONIC SECURITY CARD AND SYSTEM FOR AUTHENTICATING CARD OWNERSHIP

James A. Riccitelli, 2257 Glenkirk Drive, San Jose, Calif. 95124

Filed Aug. 15, 1974, Ser. No. 497,734
Int. Cl.² G11C *7/00, 19/00*
U.S. Cl. 235—61.7 B **9 Claims**



1. A system for authenticating the ownership of an electronic security card comprising:

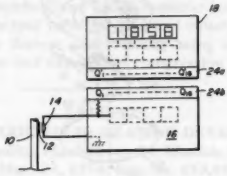
a security card means including logic circuitry which is responsive to a plurality of input signals and is adapted to provide an output signal when said input signals are in a preselected sequence and to develop a feedback control signal which is applied to and deactivates said logic circuitry when said input signals are not in said preselected sequence; and

terminal means for receiving said security card means, said terminal means including a signal source operative to provide a plurality of input signals, a switch means for selectively interconnecting said signal source means to said logic circuitry so as to apply a sequence of said input signals to said logic circuitry when said security card means is received by said terminal means, and indicating means responsive to said output signal and operative to indicate that said selective interconnection occurs in a predetermined manner.

3,934,123
EVENT RECORDER WITH CODED REMOVABLE DISPLAY

Gottfried Maurer, Needham; Patrick S. Harris, Medfield, and Wayne H. Ledder, Medway, all of Mass., assignors to Viable Systems, Inc., Needham, Mass.

Filed Feb. 11, 1974, Ser. No. 441,454
Int. Cl.² G07C *3/10;* **H03K** *21/18*
U.S. Cl. 235—92 PD **5 Claims**



1. A recorder to count the number of events performed by a machine, which comprises in combination:

a. an event recorder which includes:

i. an interface circuit in electrical communication with the machine and adapted to provide a signal, which signal relates to an event performed by the machine;

ii. at least one digital counter in communication with the interface circuit to record the number of events;

iii. a first connector in communication with the counter; and

iv. a first power supply to effect the transfer of the signal from the circuit and to power the counter, which first power supply is isolated from the machine;

b. a display unit which includes:

i. a second connector adapted to be removably mated with the first connector;

ii. at least one decoder;

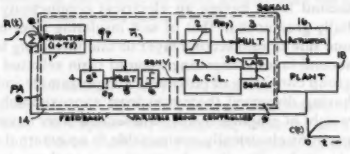
iii. means to display digitally the decoded information which reflects the status of the counter; and

iv. a second power supply disposed within the decoder to both power the counter to transfer the information stored therein and to drive the decoder in the display unit when the first and second connectors are mated.

3,934,124
SELF-ORGANIZING CONTROLLERS

Edwin Z. Gabriel, 318-B South St., Eatontown, N.J. 07724

Filed June 24, 1974, Ser. No. 482,152
Int. Cl.² G05B *13/02*
U.S. Cl. 235—150.1 **3 Claims**



1. In a plant controller of the type that includes:

a summing device responsive to command and feedback signals, respectively, to provide an output error signal *e;*

a predictor coupled to the output of said summing device for providing a predicted error signal *ep* as a function of said error signal e;

a differentiating means coupled to the output of said predicted error signal *ep;*

first multiplier means for producing a product of said predicted error signal *ep* and the output of said differentiated signal;

actuation correlation logic (ACL) for producing a pulse-width modulation (PWM) signal as a function of the output of said multiplier means, said PWM constituting the investigative part of a control action;

a lag circuit coupled to the output of the actuation correlation logic;

a second multiplier means responsive to lagged output of the said ACL and amplitude limited output of said predictor to produce an actuation logic output signal (ΔU), whereby said ACL enables said plant controller to be insensitive to relatively high frequency noise and to be more cautious in making a polarity decision,

the improvement in said plant controller that comprises:

said 1st and second multiplier means being analog multiplier means;

one input of said first multiplier means being directly coupled to the output of said predictor;

the second input of said first multiplier means being directly coupled to the output of said differentiating means, and

a bivalue function means coupled between the output of said first multiplier and input of said ACL.

3,934,125

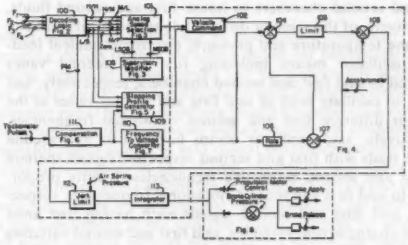
AUTOMATIC VEHICLE OPERATION SYSTEM

Samuel J. Macano, Macedon, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,727

Int. Cl.² G06F *15/48*; B01L *3/08*

U.S. Cl. 235—150.2 **14 Claims**



1. Vehicle control apparatus for accurately stopping a self-propelled vehicle within a predetermined distance at a predetermined point after receipt of a stop command by the automatic control of propulsion and braking apparatus on said vehicle including,

speed control means to control said vehicle to a velocity equal to a command velocity,

means for receiving said stop command,

digital registering means,

means for storing, responsive to receipt of said stop command for storing in said registering means a quantity lineraly related to said predetermined distance,

signal producing means responsive to vehicle wheel rotation for producing a signal related to wheel rotation,

decrementing means connected to said signal producing means for decrementing the quantity stored in said digital registering means in response to said signal, and

means connected to said registering means for generating a command velocity proportional to the value stored in said registering means.

3,934,126

CONTROL DEVICE FOR A DRAGLINE EXCAVATOR

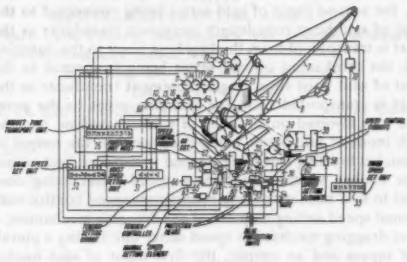
Oleg Alexandrovich Zalesov, Festivalnaya ulitsa, 7, kv. 134; Mikhail Sergeevich Lomakin, ulitsa Tkatskaya, 33/35, kv. 20; Vadim Nikolaevich Merkulov, Chernomorsky bulvar, 17, korpus 1, kv. 53; Leonid Davidovich Pevzner, ulitsa Udaltsova, 4, kv. 468; Gugo Borisovich Peters, Mosfilmovskaya ulitsa, 43/40, kv. 107; Vladimir Dmitrievich Potapov, Svobodny prospekt, 14-5, kv. 150; Vladimir Vasilievich Rzhevsky, Mosfilmovskaya ulitsa, 17-25, kv. 196; Lev Ivanovich Tolpezhnikov, Bolshaya Cheremushkinskaya ulitsa, 12, kv. 10; Anatoly Danilovich Yarizov, Starokonjushenny pereulok, 33, kv. 26, all of Moscow; Viktor Modestovich Mamkin, pereulok Druzhby, 6, kv. 60, Sverdlovsk; Veniamin Lvovich Raskin, ulitsa Khmeleva, 10, kv. 21, Sverdlovsk; Boris Ivanovich Satovsky, prospekt Ordzhonikidze, 3, kv. 77, Sverdlovsk, and Grigory Matveevich Yartsev, pereulok Druzhby, 6, kv. 60, Sverdlovsk, all of U.S.S.R.

Continuation of Ser. No. 429,700, Dec. 28, 1973, abandoned.

This application Sept. 23, 1974, Ser. No. 508,183

Int. Cl.² E02F *3/46*, G06G *7/48*

U.S. Cl. 235—150.2 **75 Claims**



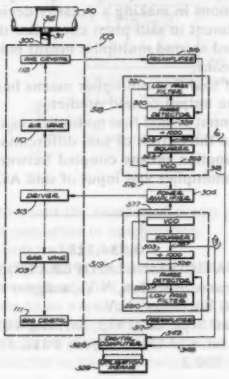
1. A control device for a dragline excavator comprising a bucket, a hoist rope and a drag rope of said bucket, a platform, a mechanism for hoisting said bucket, a mechanism for dragging said bucket, and a mechanism for swinging said platform of the dragline excavator; wherein all of said mechanisms move the bucket in a digging operation and in the transportation of the bucket to the dumping point and to the point where the bucket is lowered on the face of an excavation; wherein the control device comprises: a transducer for sensing the length increments of said hoist rope as the bucket is transported from the breakout point on the face of said excavation to the dumping point; a transducer for sensing the length increments of said drag rope as the bucket is transported from the breakout point of the face of said excavation to the dumping point; a transducer for sensing the swing angle of said platform as the bucket is transported from the breakout point on the face of said excavation to the dumping point; a transducer for sensing the length increments of the hoist rope as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation; a transducer for sensing the length increments of the drag rope as the bucket is transported from the dumping point where it is lowered on the face of said excavation; a transducer for sensing the swing angle of the platform as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation; a transducer for sensing the speed of said bucket hoisting mechanism; a transducer for sensing the speed of said bucket dragging mechanism; a transducer for sensing the speed of said platform swinging mechanism; a speed control unit of the bucket hoisting mechanism for controlling the bucket hoisting mechanism; a speed control unit of the bucket dragging mechanism for controlling the bucked dragging mechanism; a speed control unit of the platform swinging mechanism for controlling the platform swinging mechanism, a bucket transportation time calculator unit hav-

ing a plurality of inputs and an output; said inputs of the bucket transportation time calculator being connected to the output of said hoist rope length increment transducer as the bucket is transported from the breakout point on the face of said excavation to the dumping point, to the output of said drag rope length increment transducer as the bucket is transported from the breakout point on the face of said excavation to the dumping point, to the output of said platform swing angle transducer as the bucket is transported from the breakout point on the face of said excavation to the dumping point, to the output of said hoist rope length increment transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, to the output of said drag rope length increment transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, to the output of said platform swing angle transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, to the output of said bucket hoisting mechanism speed transducer, and to the output of said bucket dragging mechanism speed transducer; a bucket hoisting mechanism speed setter unit having a plurality of inputs and outputs; the first input of said setter being connected to the output of said bucket transportation time calculator, the second input of said setter being connected to the output of said hoist rope length increment transducer as the bucket is transported from the breakout point to the dumping point, the third input of said setter being connected to the output of said hoist rope length increment transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, and the fourth input of said setter being connected to the output of said bucket hoisting mechanism speed transducer, said output of the bucket hoisting mechanism speed setter being connected to said bucket hoisting mechanism speed control unit; a manual speed setting element of the dragging mechanism; a bucket dragging mechanism speed setter unit having a plurality of inputs and an output, the first input of said bucket dragging mechanism speed setter being connected to the output of said bucket transportation time calculator, the second input being connected to the output of said drag rope length increment transducer as the bucket is transported from the breakout point to the dumping point, the third input being connected to the output of said hoist rope length increment transducer as the bucket is transported from the breakout point to the dumping point, the fourth input being connected to the output of said drag rope length increment transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, the fifth input being connected to the output of said hoist rope length increment transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, the sixth input being connected to the output of said manual speed setting element of the dragging mechanism, the seventh input being connected to the output of said bucket hoisting mechanism speed setter, and said output of the bucket dragging mechanism speed setter being connected to said bucket dragging mechanism speed control unit; a platform swinging mechanism speed setter unit having a plurality of inputs and an output; the first input of said platform swinging mechanism speed setter being connected to the output of said bucket transportation time calculator, the second input of said platform swinging mechanism speed setter being connected to the output of said platform swing angle transducer as the bucket is transported from the breakout point to the dumping point, the third input of said platform swinging mechanism speed setter being connected to the output of said platform swing angle transducer as the bucket is transported from the dumping point to the point where it is lowered on the face of said excavation, the fourth input of said platform swinging mechanism speed setter being coupled to the output of said platform swinging speed transducer, and the output of said platform swinging mechanism speed setter being connected to said platform swinging mechanism speed contol unit.

3,934,127
GRAVITOMETERS

Gerald Lance Schlatter, and Charles Eveleigh Miller, both of Boulder, Colo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,212
Int. Cl.[2] G01N 9/00; G06F 7/00
U.S. Cl. 235—151.34 **34 Claims**



1. A gravitometer comprising: a twin cell assembly having first and second chambers to house first and second fluids, respectively, of the same or different densities at substantially the same temperature and pressure; electromechanical feedback oscillator means including first and second vanes mounted in said first and second chambers, respectively, and means to oscillate both of said first and second vanes at the same or different first and second vibrational frequencies, respectively, said oscillator means having first and second output leads with first and second respective signals thereon of first and second respective frequencies directly proportional to said first and second vibrational frequencies, respectively, said first and second signals each having first annd second characteristic variables, said first and second variables of said first signal being the frequency f_a thereof and the period T_a thereof, respectively, said first and second variables of said second signal being the frequency f_a thereof and the period T_a thereof, respectively; and computer means connected from said oscillator means output leads having an output lead means for producing an output thereon directly proportional to the ratio of the density of said second fluid to that of said first fluid as a function of only the first variable of one signal and only the second variable of the other signal.

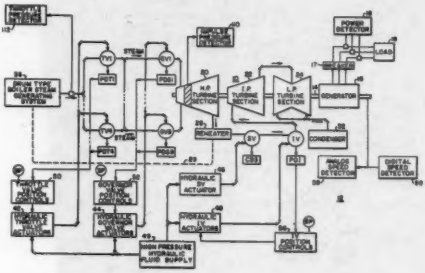
3,934,128
SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH IMPROVED ORGANIZATION OF LOGIC AND OTHER FUNCTIONS IN A SAMPLED DATA CONTROL

Robert Uram, East Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 247,551, April 26, 1972, abandoned.
This application Oct. 16, 1973, Ser. No. 407,024
Int. Cl. F01d 17/02; G05b 15/00; G06f 15/06
U.S. Cl. 235—151.21 **16 Claims**

1. A system for operating a steam turbine in an electric power plant, said system comprising an arrangement of throttle and governor valves for supplying steam to the turbine, means for actuating said valves to position said valves in accordance with valve position signals, means for generating

signals representative of the turbine speed and the turbine load and other turbine variables, a digital controller having means for generating a speed setpoint and means for generating a load setpoint, means for coupling the turbine speed and load signals and the other turbine variable signals to said digital controller on a periodic or demand basis, means for registering the coupled speed and load and other turbine variables in said digital controller, said digital controller including a speed control for periodically generating valve position outputs in response to the turbine speed and speed setpoint during turbine startup, said digital controller further including a load control for periodically generating valve position outputs in response to the turbine load and load setpoint during turbine load operation, means for continuously generating the valve position signals in response to the valve position outputs, said coupling means including means for generating contact signals representative of predetermined turbine variables and for scanning such signals on a predetermined basis for registration in said digital controller, said coupling means further including means for converting input analog signals to digital signals and for periodically scanning the digital signals for registration in said digital controller, an operator panel having switching means for generating control mode and control parameter signals, means for coupling the operator panel signals to said digital controller and for registering such signals in said digital controller, said speed and load controls having a plurality of control elements and mode switching means for determining which elements are operative in the functioning of the controls, a logic control for generating mode control outputs for operating said mode switching means in response to the registered control mode panel signals and the registered turbine contact signals, said digital controller including means for generating synchronous outputs to trigger the operation of said speed and load controls on a periodic basis, and means for operating said logic control on demand in response to changes in the panel or turbine contact signals.



3,934,129

APPARENT WIND DIRECTION INDICATOR

Lucian W. Taylor, Los Altos, and George J. Ellers, Redwood City, both of Calif., assignors to Velcon Filters, Inc., San Jose, Calif.

Division of Ser. No. 347,380, April 3, 1973, Pat. No. 3,881,095. This application Aug. 21, 1974, Ser. No. 499,253

Int. Cl.[2] G01P *13/02*; **G06G** *7/18*

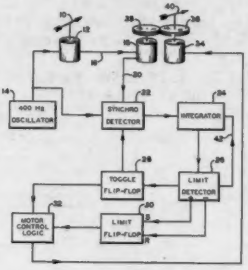
U.S. Cl. 235—151.34 **14 Claims**

1. An apparatus for indicating the average apparent wind direction, comprising:

a source for generating a signal representing instantaneous apparent wind direction;

a source of a reference signal;

means responsive to said instantaneous apparent wind direction signal, said reference signal and an average apparent wind direction indication for producing an average error signal; and



means responsive to said average error signal for indicating the average apparent wind direction.

3,934,130

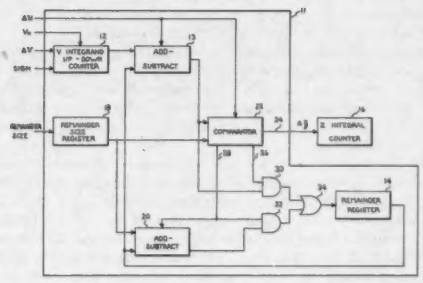
DIGITAL DIFFERENTIAL ANALYZER

Richard Lynn Friberg, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 22, 1974, Ser. No. 499,509

Int. Cl.[2] G06J *1/02*

U.S. Cl. 235—150.31 **11 Claims**



1. A digital differential analyzer circuit for generating an output signal representing an incremental change of an integral scaled by a factor other than powers of the radix of the number system employed comprising:

a. means for storing a first digital number representing the current value of a first variable;

b. means for storing a second digital number representing a selectable remainder size;

c. a memory register for storing a new remainder number;

d. arithmetic and logic means responsive to an input signal representing an incremental change of a second variable for algebraically combining the first digital number and the number in the memory register to form a new remainder number, for comparing the magnitude of the new remainder number to the magnitude of the selected remainder size number, for causing said new remainder number to be stored in the memory register if the magnitude of the new remainder number is less than the magnitude of the remainder size number, for forming the difference between the magnitude of the new remainder number and the remainder size number if the magnitude of the new remainder number is greater than the magnitude of the remainder size number, and for storing said difference in the memory register; and

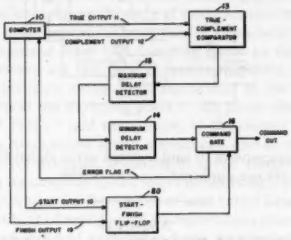
e. circuit means for generating said output signal when the magnitude of the new remainder number is greater than the magnitude of the remainder size number.

3,934,131

OUTPUT CONTROLLER FOR INITIATING DELAYED OR CONDITIONAL COMMANDS VIA A GENERAL PURPOSE COMPUTER

James A. Perschy, Laurel, Md., assignor to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 6, 1975, Ser. No. 538,657
Int. Cl.² G06F 11/00
U.S. Cl. 235—153 A 6 Claims



1. A command controller for a computer system comprising, in combination,

a computer means for outputting a data signal corresponding to each desired command,

comparator means responsive to said data output signal for detecting data errors within said data signal,

timing error detecting means for checking said data signal corresponding to the desired command output for timing errors relative to a pair of preselected time limits corresponding respectively to minimum and maximum permitted times within said computer system for outputting of a command,

said computer means further generating a signal means demarcating the desired beginning and ending time limits for said desired output command, and

means responsive to said comparator means and said timing error detecting means for generating an error flag signal fed back to said computer means if a data or timing error is detected for said command output signal from said computer means.

3,934,132

SHIFT NETWORK FOR DUAL WIDTH OPERANDS

Daniel J. Desmonds, Roseville, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed June 10, 1974, Ser. No. 477,884
Int. Cl.² G06F 7/00
U.S. Cl. 235—164 1 Claim

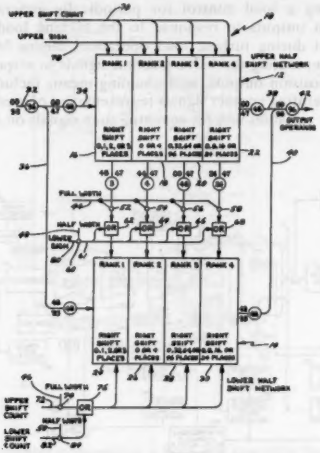
1. A shift network which may operate in two alternate shift modes, the shift mode being preselected, the first mode being the shifting of a single full width input operand and the second mode being the shifting of two independent one half width input operands, said network comprising

an upper half section,

said section being comprised of a plurality of ranks of logic gates which operate on individual bits of operands to switch said operand bits to different outputs corresponding to a partial shift to be performed by said rank, connected in serial order, each rank being responsive to a preselected control signal to perform the designated partial shift such that all of said ranks can perform any operand shift of a designated possible group of shifts, said upper half section receiving as an input in said first mode the upper half of full width operands and in said second mode the upper operand of a pair of operands, said input depending on the preselected shift mode,

a lower half section,

said section being comprised of a plurality of ranks of logic gates which operate on individual bits of operands to switch said operand bits to different outputs corresponding to a partial shift to be performed by said rank, connected in serial order each rank being responsive to a preselected control signal to perform a designated partial shift such that all of said ranks can perform any operand shift of a designated possible group of shifts, said lower half section receiving as an input in said first mode the



lower half of full width operands and in said second mode the lower operand of a pair of operands, said input depending on the preselected shift mode; and

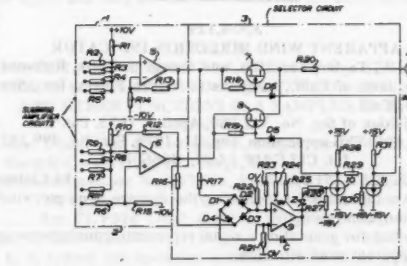
means for connecting said upper and lower half sections comprised of logic gates responsive to control signals designating the preselected shift mode of said shift network to transfer bits of operands from the upper half section to the lower half section in the full width mode and to transfer sign extension bits in the half width mode to the lower half section.

3,934,133

APPARATUS FOR THE CORRECTION OF SHEAR FORCES

Leif Ragnvald Sten, Staffanstorp, and Nils Runol Gustav Ohlsson, Akarp, both of Sweden, assignors to Kockums Mekaniska Verkstads AB, Malmo, Sweden

Filed May 22, 1973, Ser. No. 362,992
Claims priority, application Sweden, May 30, 1972, 7069/72
Int. Cl.² G06G 7/12; H04Q 3/00
U.S. Cl. 235—193 2 Claims



1. An apparatus for correcting a signal representing total shear force in a given cross-section of a ship for the distribu-

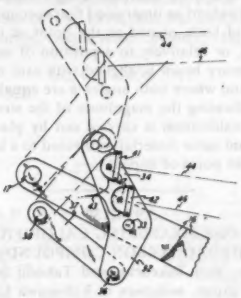
tion of shear forces within said section, comprising means for applying said signal to a first summing amplifier means means for applying a signal representing at least part of the entire cargo forward of the selected cross-section to said first summing amplifier means, means for applying said total shear force signal to a second summing amplifier means, means for applying a signal representing at least part of the cargo aft of the selected cross-section, to said second summing amplifier means, selector circuit means connected to said amplifier means and for passing on the numerically largest signal of the two output signals obtained from said amplifier means and means for indicating said largest signal.

3,934,134

LAMP MOUNTING FOR A MATERIAL-HANDLING TRACTOR

Hilary S. Wassel, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 3, 1975, Ser. No. 554,756
Int. Cl.² B60Q *1/00*
U.S. Cl. 240—57 **8 Claims**



1. In a tractor-mounted material-handling bucket apparatus of the type including a tractor and a boom pivotally mounted on the tractor for up and down pivotal movement and a bucket pivotally supported by said boom and being movable between a lowered loading position and a raised dumping position, the improvement comprising a lamp mounting member movably connected with said boom for movement in response to and according to pivotal movement of said boom, an alignment member connected with said lamp mounting member for moving said lamp mounting member relative to said boom and thereby align said lamp mounting member according to but different from the various up and down pivoted positions of said boom on said tractor, and a lamp attached to said lamp mounting member for illuminating toward said bucket.

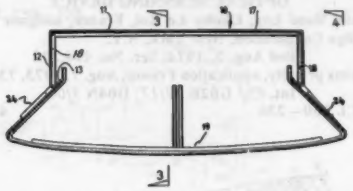
3,934,135

FLUORESCENT LAMP FIXTURE

Leon Szer, 35 Bealiba Road, South Caulfield, Victoria, 3162, Australia

Filed July 5, 1973, Ser. No. 376,359
Claims priority, application Australia, Feb. 1, 1973, 51683/73
Int. Cl.² F21S *1/02*; F21V *3/02*
U.S. Cl. 240—78 LD **1 Claim**

1. A fluorescent light fitting adapted to be mounted on a surface for projecting light therefrom which includes: a base plate adapted for securement to said surface, said plate having inwardly-directed flanges; a removable diffuser for mounting to said base plate and for projecting said light in a predetermined manner, said diffuser having outwardly-directed flanges which are adapted to inter-engage said inwardly-directed flanges of said base plate so as to hold said diffuser in position with respect to said base plate; and end caps for mounting to the ends of said base plate, each of which have extensions complementary to said base plate for frictional inter-engagement with said base plate and where the end caps extend below the base plate and each has an inwardly-directed lower flange, which lower flange defines a required shape for the diffuser, the diffuser being flexible, and when located with its



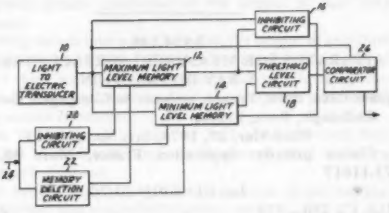
ends beneath the said lower flanges, assumes the required shape; wherein said diffuser has a main surface which lies beneath the lower flanges, an intermediate inwardly-directed flange along each edge of the main surface, and the outwardly-directed flange extends from the intermediate flanges; and wherein the lower flange of the end caps are so formed relative to the intermediate flanges of the diffuser, that the diffuser can hinge at either end of the lower flanges.

3,934,136

THRESHOLD SIGNAL CIRCUITRY FOR SCANNING APPARATUS

David J. Schoon, Marine on St. Croix, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 6, 1974, Ser. No. 466,976
Int. Cl.² H01J *39/12*
U.S. Cl. 250—214 R **7 Claims**



1. A circuit for providing a scanning threshold signal for a scanning apparatus having a light to electric transducer, said signal determined in response to the output of said transducer produced during a threshold signal determining scan of a field comprising:

a first memory circuit portion connected to the output of the light to electric transducer for storing a signal indicative of the maximum output of the light to electric transducer during the threshold signal determining scan;

a second memory circuit portion connected to the output of the light to electric transducer for storing a signal indicative of the minimum output of the light to electric transducer during the threshold determining scan;

inhibiting circuit portion connected to said transducer, said first memory circuit portion and said second memory circuit portion for preventing said second memory circuit portion from responding to the output from the light to electric transducer that is less than a predetermined portion of the signal stored by said first memory circuit portion; and

a threshold level circuit portion connected for receiving said signal stored by said first memory circuit portion and said signal stored by said second memory circuit portion

for providing a threshold level signal that is less than said signal stored by said first memory circuit portion and greater than said signal stored by said second memory circuit portion.

3,934,137

OPTICAL SCANNING DEVICE

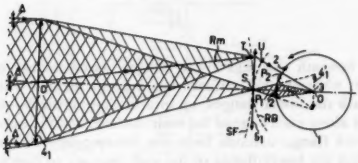
Fernand René Loy, Choisy Le Roi, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,392

Claims priority, application France, Aug. 7, 1973, 73.28824

Int. Cl.² G02B *27/17*; **H04N** *3/06*

U.S. Cl. 250—236 **4 Claims**



1. An optical scanning device in which radiation beams originating from different zones of a field of view are consecutively converged onto a radiation sensitive detector, which device comprises an objective, a rotatable opitcal cylinder, at least one optical convergence system on the circumference of the cylinder, the detector being disposed in the center of rotation of the cylinder, and an optical projection system means between the objective and the cylinder for directing a radiation beam which passes through the objective towards the detector and for optically conjugating the center of the objective with the center of rotation of said cylinder.

3,934,138

APPARATUS FOR MEASURING SURFACE STRESS BY X-RAY DIFFRACTION

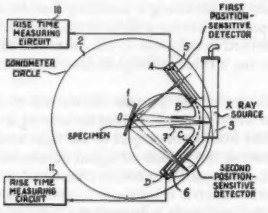
Jeans Bens, Paris, France, assignor to Compagnie General de Radiologie, Paris, France

Filed Mar. 27, 1974, Ser. No. 455,513

Claims priority, application France, Mar. 30, 1973, 73.11617

Int. Cl.² G01N *23/20*

U.S. Cl. 250—278 **4 Claims**



1. Apparatus for measuring stress on the surface of a polycrystalline body by X-ray diffraction, by means of measuring the variation of the interplanar spacings of a set of lattice planes as a function of the angle ψ between the normal to the lattice planes diffracting the incident primary X-ray beam and the normal, at the point of impact of said primary beam to the surface of the body whose stress is to be measured, said apparatus comprising in combination: a single X-ray source for emitting a narrow primary X-ray beam rendered quasi-monochromatic by filtering and having a focal point whereon the X-ray beam originates; first and second position-sensitive radiation detectors having elongated collector electrodes for respectively simultaneously receiving two secondary X-ray beams diffracted by a single set of lattice planes at the surface of said body and for respectively delivering signals for simultaneously localizing, by means of an electronic measuring circuit, the respective points of penetration of said secondary beams into said detectors, said detectors being assembled fixedly and integrally with said X-ray source, summetrically to said X-ray source and primary X-ray beam and facing the same side of said body surface as said X-ray source; and means for pivotably mounting the integral assembly made up from said X-ray source and said symmetrically positioned detectors for rotation about an axis traversing said primary X-ray beam at said point of impact on said body surface, tangentially to said surface, and perpendicular to a plane defined by said focal point, said primary beam and said collector electrodes, combined with means for measuring the angular position of said focal point relatively to said normal to said body surface, whereby to simultaneously measure the differences of the interplanar spacings corresponding to two different angles ψ, preferably by means of one of two equivalent methods for obtaining the indication corresponding to absence of stress, i.e. either relatively to an unstressed first specimen of the same material as said body placed at the point of impact of said primary beam, or relatively to a position of said focal point where the primary beam is aligned with said normal to said body surface and where both angles ψ are equal to zero, these differences indicating the magnitude of the stress to be measured, whose calibration is carried out by placing a second specimen of said same material, subjected to a known amount of stress, at said point of impact.

3,934,139

APPARATUS FOR MEASURING CALORIFIC POWER OF HYDROCARBON COMPOUNDS

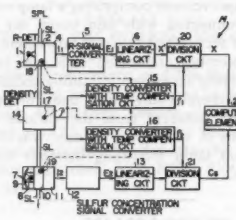
Shuichi Ohata; Yoji Takeuchi, and Takeshi Ishiguro, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Sept. 19, 1973, Ser. No. 398,683

Claims priority, application Japan, Sept. 29, 1972, 47-98360

Int. Cl.² G01N *23/00*

U.S. Cl. 250—308 **11 Claims**



1. An apparatus for measuring the calorific power of a sample containing hydrocarbon compounds and sulfur, comprising:

means for generating gamma rays or x-rays at an energy level for which the mass absorption coefficient of carbon differs from that of hydrogen;

means for applying the gamma rays or x-rays to the sample;

means for detecting the absorption rate of the gamma rays or x-rays by the sample and for generating a signal varying with the samle density and with the concentrations of carbon, hydrogen and sulfur in the sample;

means for measuring the density of the sample and for generating a signal varying therewith;

means for measuring the concentration of sulfur in the sample and for generating a signal varying therewith, said

means comprising means for generating gamma rays or x-rays at an energy level for which the mass absorption coefficient of carbon is about equal to that of hydrogen, means for applying the gamma rays or x-rays to the sample, an ionization chamber for generating a signal varying exponentially with the concentration of sulfur in the sample, and linearizing circuit means receiving the exponentially varying signal and generating a signal varying linearly with the concentration of sulfur in the sample, and

means for accepting the signal varying with density and the concentrations of carbon, hydrogen and sulfur, the signal varying with density, and the signal varying with sulfur concentration and for mathematically correlating said signals according to a predetermined arithmetic formula to directly obtain the calorific power of the sample.

3,934,140
X-RAY DIAGNOSTIC APPARATUS IN PARTICULAR FOR EXAMINING THE INJURED

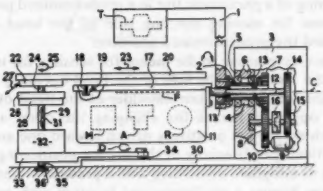
Christian Dutertre, and Jean Daugé, both of Argueil, France, assignors to Etablissements Dutertre, Paris, France

Filed Oct. 9, 1974, Ser. No. 513,511

Claims priority, application France, Oct. 12, 1973, 73.36611

Int. Cl.² G03B 5/17

U.S. Cl. 250—320 **5 Claims**



1. An X-ray diagnostic apparatus particularly intended for examining injured patients, comprising:

an X-ray source for emitting an X-ray beam;

a film-handling device for receiving said X-ray beam traversing said patient, for delivering a visible image thereof and including within a lightproof housing a mechanism for displacing the film it contains in substantially one direction to and from the exposure field irradiated by said X-ray beam;

an arm member for carrying said X-ray source at one end thereof and for locating said source at a predetermined distance from said exposure field;

a pair of coaxial, horizontal, independently rotatable shafts having a common horizontal axis, the first one of which having the other end of said arm member secured thereto and the second one supporting said film handling device in such a way that said common axis is located in the plane of the film in the exposure field and that said direction of film displacement is parallel to said common axis;

a framework including a mechanism for driving said coaxial shaft pair and for supporting it through a cylindrical opening thereof by means of bearings;

a first supporting plate fixed to the ground for carrying said framework thereon; and

means for horizontally supporting a patient mounted on a second, movable supporting plate pivotable about a first vertical shaft secured to said first supporting plate, said first vertical shaft having an axis intersecting, at the center of said exposure field, with both said common axis and the central ray of said X-ray beam.

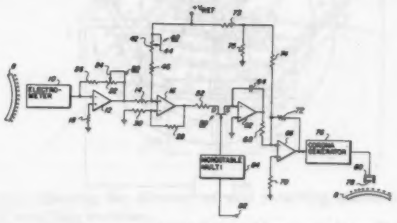
3,934,141
APPARATUS FOR AUTOMATICALLY REGULATING THE AMOUNT OF CHARGE APPLIED TO AN INSULATING SURFACE

Rudolph Vargas, Jr., Alhambra, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed July 3, 1974, Ser. No. 485,412

Int. Cl.² G03B 15/02

U.S. Cl. 250—325 **12 Claims**



1. Apparatus for maintaining the electrostatic potential on the surface of an insulator at a predetermined value, a point on said insulator surface passing a fixed reference point in a periodic manner comprising:

first means for generating a first signal indicative of the magnitude of the electrostatic potential on said insulator surface,

second means for producing a reference signal which is proportional to said predetermined electrostatic potential,

third means coupled to said first means and said second means for producing an error signal indicative of the difference between said first signal and said reference signal,

integrator means connected to the output of said third means,

switching means interposed between the output of said third means and said integrator means whereby the output of said third means is directly coupled to said integrator means for a predetermined time period when said switching means is enabled,

means for applying a pulse of said predetermined time period to said switching means whereby said switching means is enabled,

a high voltage supply coupled to the output of said integrator means and controlled thereby, and

means for coupling the output of said high voltage supply to a corona electrode positioned adjacent said insulator surface, the charge on said insulator surface being controlled thereby during said predetermined time period thereby causing said insulator surface to be maintained at said predetermined electrostatic potential.

3,934,142
RADIOGRAPHY

Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed July 17, 1974, Ser. No. 489,084

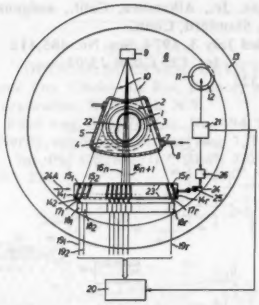
Claims priority, application United Kingdom, July 21, 1973, 34859/73

Int. Cl.² G03B 41/16

U.S. Cl. 250—360 **8 Claims**

1. Radiographic apparatus comprising a source of penetrating radiation arranged to project a swath of radiation across a space for location of a body to be examined, means for collimating the radiation into a set of beams with gaps between adjacent beams, detector means for detecting the respective beams and for producing output signals dependent on the radiation transmitted in said beams, means for orbiting said source, said collimating means, and said detector means

in the plane of said swath, and means for additionally displacing at least said collimating means relative to the source so



that the relative positions of the beams and the gaps are changed during the orbital movement.

3,934,143

DETECTOR FOR IONIZING RADIATION

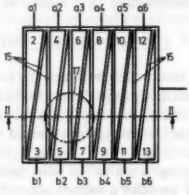
Rudolf Prag, Marloffstein, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Nov. 2, 1973, Ser. No. 412,431

Claims priority, application Germany, Nov. 10, 1972, 2255095

Int. Cl. G01t *1/24*

U.S. Cl. 250—370 **5 Claims**



1. In a detector for ionizing radiation, comprising semiconductor plate means having a plurality of electrode strip means, said electrode strip means being positioned on the surface of said semiconductor plate means passed through by said radiation and extending from a first edge of said semiconductor plate means in the direction of the opposite edge thereof; and signal converting means connected to said electrode strip means, said signal converting means including computing means being adapted to compute and generate signals in response to signals tapped off from said electrode strip means indicative of the locations of focal points of radiation spots generated on said detector, the improvement comprising; said plurality of electrode strip means each varying in cross-section along the length thereof being positioned on said one surface of said semiconductor plate means and varying in cross-section along their longitudinal extensions in conformance with a predetermined function; a plurality of connectors each respectively connecting one of said electrode strip means to said signal converting means for separately transmitting the signals from each said electrode strip means to said signal converting means; and a common electrode means being positioned on the opposite surface of said semiconductor plate means and being dimensioned so as to cover substantially said entire surface said computing means being connected to derive a signal as a mathematical function of the signals on a plurality of said connectors.

3,934,144

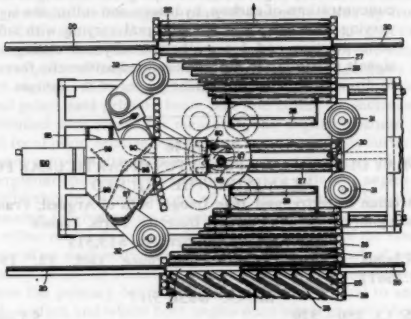
X-RAY MACHINE FOR RAPID AND PRECISE INSPECTION OF MIXED SIZES OF PNEUMATIC TIRES

Donald T. Green, Mentor, and James L. Snarr, Eastlake, both of Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1974, Ser. No. 459,895

Int. Cl.² G01N *23/00*

U.S. Cl. 250—358 T **16 Claims**



1. In a tire inspection machine

a. means for sensing the presence of one side of the bead opening of a pneumatic tire in a predetermined position;

b. means for moving the one side of the bead opening toward the predetermined position;

c. means, responsive to the means for sensing, for terminating the motion of the side of the bead opening;

d. means for engaging one shoulder of the tread of the tire and opposing means for engaging the other shoulder, which means are positively driven toward one another at identical speeds axially of the tire for positioning the tire with its midplane coinciding with a predetermined plane;

e. means having a predetermined location with respect to the predetermined position and predetermined plane, for indicating the presence of structural irregularities in a tire and the location of the irregularities with respect to the predetermined plane.

3,934,145

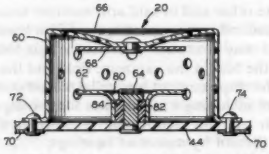
IONIZATION SMOKE DETECTOR AND ALARM SYSTEM

John Dobrzanski, New Britain, and Ernest V. Hart, West Hartford, both of Conn., assignors to Emhart Corporation, Farmington, Conn.

Filed Oct. 25, 1973, Ser. No. 409,647

Int. Cl.² G01T *1/18*

U.S. Cl. 250—381 **13 Claims**



1. An ionization smoke detector having a sensing chamber comprised of:

a mounting board;

a perforated metallic shell defining an open interior space and supported at one side on the mounting board with the one side and the board in adjacent relationship;

an electrode mounted on the board and positioned within the open interior space of the metallic shell adjacent the one side in electrically insulated relationship to the metallic shell, the electrode having a surface facing away from the board and toward the side of the shell opposite the one side and defining an aperture in the middle of the surface; and

a radiation source supported from the mounting board in the aperture of the electrode for exposure within the interior space of the shell.

3,934,146

TIME-MEASURING DEVICE FOR AN X-RAY GENERATOR

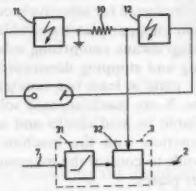
Heinz Mester, and Gerd Vogler, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,535

Claims priority, application Germany, Mar. 22, 1973, 2314265

Int. Cl.² H05G *1/00*

U.S. Cl. 250—402 **10 Claims**



1. A time-measuring device for an x-ray generator of the type including a high voltage transformer for supplying anode current to an x-ray tube, a switch connected in the transformer primary circuit and an automatic exposure device for determining the radiation dose of an irradiated body comprising, means for effectively measuring time intervals, and means responsive to a switch-on pulse for the x-ray generator for effectively reducing the time interval measured by said time measuring means by an amount which varies with the anode current of the x-ray tube.

3,934,147

PATIENT SUPPORT WITH WEIGHT-SENSITIVE SPRING SCALE FOR CONTROLLING MOTOR OPERATION

Winfried Platz, Rathsberg; Ulrich Bar, Nurnberg, and Martin Schmidt, Eltersdorf, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

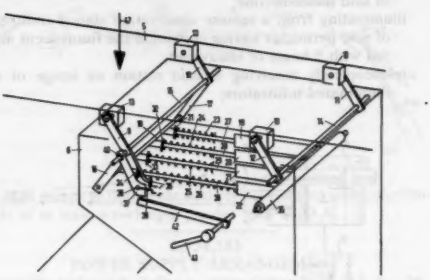
Filed Feb. 8, 1974, Ser. No. 440,708

Claims priority, application Germany, Feb. 13, 1973, 2307044

Int. Cl. G01n *23/00*

U.S. Cl. 250—445 **8 Claims**

1. A device for supporting a patient for use with a medical apparatus, said device comprising a carrying member, a substantially horizontally extending support for the patient, a motor for varying the distance between said support and said medical unit, a supply circuit for said motor, and a spring scale between said support and said carrying member, said spring scale having a switching member shiftable depending upon the weight of a patient, said switching member having switching means for interrupting said supply circuit for said motor and



means adjusting the distance of said switching means from said switching member.

3,934,148

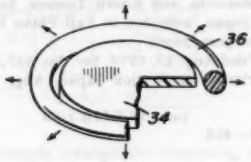
FLUORESCENT PLASTIC CONTROLLED DIRECTION LAMP

William O. Collins, 6258 N. Kensington St., McLean, Va. 22101

Filed May 28, 1974, Ser. No. 474,078

Int. Cl.² F21S *11/00*; G02B *5/14*

U.S. Cl. 250—458 **3 Claims**



1. A controlled light distributing unit comprising a fluorescent plastic member having a terminal light emitting surface emitting light therefrom in response to sunlight impinging upon a surface with the sunlight impinging surface being larger than the terminal light emitting surface, and a transparent, light collecting and distributing member having a curved surface in spaced, adjacent and aligned relation to the terminal light emitting surface of the fluorescent plastic member for receiving light emitted therefrom and a curved surface opposite from the terminal light emitting surface for emitting the received light therefrom, said fluorescent plastic member being a substantially flat circular sheet with the peripheral edge thereof defining the terminal light emitting surface, said light collecting and distributing member being an annular ring having a circular cross section disposed in adjacent spaced aligned concentric relation with the peripheral edge of the circular sheet and receiving light therefrom.

3,934,149

METHOD OF IDENTIFYING ENEMY FORCES

Richard B. Nehrich, Jr., 4019 Marlesta Drive, San Diego, Calif. 92111, and David K. Forbes, 2216 Crownhill Road, San Diego, Calif. 92109

Continuation-in-part of Ser. No. 726,615, May 3, 1968, abandoned. This application Aug. 19, 1974, Ser. No. 498,354

Int. Cl.² G01N *21/38*

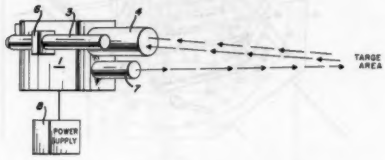
U.S. Cl. 250—459 **1 Claim**

1. A method of identifying infiltrators at a distance up to 150 yards in sunlight and nighttime conditions that have passed through a protected outdoor zone comprising the steps of:

depositing a tacky, high intensity, fluorescent material having a narrow spectral bandwidth in the range of 100 angstroms or less over a perimeter portion of the surface of said outdoor zone;

illuminating from a remote observation station infiltrators of said perimeter having contacted the fluorescent material with a beam of ultraviolet;

telescopically receiving at said station an image of said illuminated infiltrators;



spectroscopically analyzing at said station said telescopically received image of said illumination to observe the presence of said narrow bandwidth fluorescent material characterized by a sharp spike-like energy emission, enabling distinctive visual discrimination between the fluorescent light from the marked infiltrator and the fluorescent light of any reflected sunlight from the zone.

3,934,150

PHOTOGRAPHIC SHEET-LIKE FILM FEEDING DEVICE

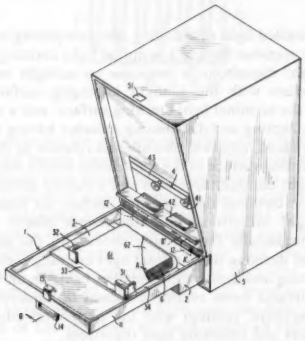
Takaaki Matsumoto, and Kaoru Tamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 13, 1974, Ser. No. 497,157

Claims priority, application Japan, Aug. 17, 1973, 48-96512[U]

Int. Cl.² G11B 1/00

U.S. Cl. 250—468 **4 Claims**



1. A photographic sheet film feeding device comprising:

a film loading means for receiving stacked sheets of film, said film sheets being covered by an inverted U-shaped doupling plate and contained in an internally loaded bag in a light-tight condition and supporting said film sheets and said bag in an upright position, a cutter mechanism for cutting and unsealing the lower end of said internally loaded, upright bag, and a film discharging means for raising the upper end of said internally loaded bag and said U-shaped doubling plate covering the front, rear and upper edge of the upright film sheets in order to uncover the sheets of the film contained in said bag from the raised portion of said internally loaded bag.

3,934,151

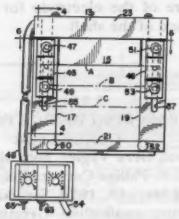
CHOPPER ASSEMBLY FOR X-RAY MACHINE

Ralph A. Stowe, 208 Frank, Joliet, Ill. 60435, and Joseph W. Howe, 1446 N. Webster St., Naperville, Ill. 60540

Filed Aug. 14, 1974, Ser. No. 497,324

Int. Cl.² G21K 1/04

U.S. Cl. 250—505 **2 Claims**



1. An assembly for use in operating conjunction with an X-ray machine for obtaining X-ray photographs of a patient, a chopper subassembly comprising a frame mountable between the source of X-ray of the machine and the patient, said frame including an opening therein for permitting the X-rays to pass therethrough, at least two vertically movable chopper plates each slidably mounted for selectively covering a portion of said opening, said chopper plates movable downwardly by gravity, movable stop means comprising solenoids with each solenoid controlling and stopping downward movement of a respective chopper plate at least two time clocks electrically connected with the X-ray machine, said solenoids being respectively controllable by said clocks and said clocks being operable in conjunction with the machine to controllably actuate said solenoids to control the movement and positioning of said chopper plates.

3,934,152

ENCLOSURE FOR CONFINING RADIO-ACTIVE PRODUCTS OR WASTE

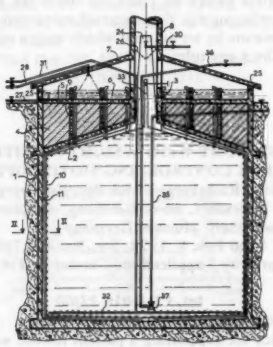
Jean Alleaume, Saint Cloud, France, assignor to Technigaz, Paris, France

Filed Dec. 6, 1973, Ser. No. 422,415

Claims priority, application France, Dec. 13, 1972, 72.44346

Int. Cl. G21f 7/00

U.S. Cl. 250—506 **15 Claims**



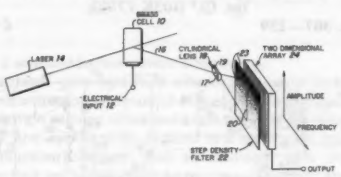
1. An enclosure for confining radio-active products, comprising in combination: a substantially fluid-tight outer rigid supporting shell structure made from reinforced concrete and buried in the ground and opening to the outside through a reinforced concrete chimney-stack; a first vessel containing

said radio-active products which forms a primary barrier and consists of thin corrugated stainless steel sheet material formed with two orthogonally intersecting series of spaced parallel corrugations, a second vessel forming a secondary barrier made from thin corrugated stainless steel sheet material formed with two orthogonally intersecting series of spaced parallel corrugations and which is located between said rigid supporting shell structure and said first vessel; means for cooling said vessels through fluid flow circulation induced by natural convection within channels adjacent to at least one of said vessels and means for feeding and discharging said radio-active products into and from said first vessel.

3,934,153
ELECTRO-OPTIC SYSTEM WITH EXPANDED POWER RANGE

John P. Lindley, Redwood City, and James Rieden, San Jose, both of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 10, 1975, Ser. No. 540,288
Int. Cl.² H01J 39/12
U.S. Cl. 250—578 **7 Claims**



4. A system for measuring the distribution and intensity of a two dimensional radiation pattern having radiation signals spaced along an X axis and each radiation signal having a component extending along a Y axis substantially perpendicular to said X axis, and comprising:

a. two dimensional photodetector means for detecting radiation along both said X and Y axes;

b. means for directing said two dimensional pattern of radiation onto said two dimensional photodetector means, said radiation pattern having radiation signals spaced along said X axis and each radiation signal having a component extending along a Y axis substantially perpendicular to said X axis; and

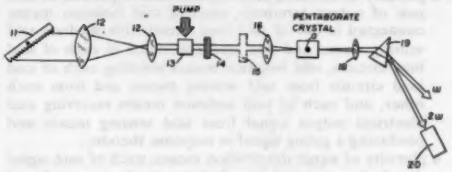
c. a density filter means, positioned in the radiation path between said means for directing radiation and said two dimensional photodetector means, for varying the intensity of radiation along said Y axis such that the density filter means allows a substantial portion of the radiation to pass at one segment along the Y axis and allows less and less radiation to pass at other segments along the Y axis, whereby the output of the photodetector means defines the position of all signals along said X axis, and the amount of radiation detected along said Y axis by said photodetector means indicates the intensity of the detected radiation.

3,934,154
SOURCE OF ULTRAVIOLET LIGHT EMPLOYING A LASER PUMPED BORATE CRYSTAL

William R. Cook, Jr., 684 Quilliams Road, Cleveland Heights, Ohio 44121

Continuation-in-part of Ser. No. 472,995, May 24, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,526
Int. Cl.² G02F 1/37
U.S. Cl. 307—88.3 **6 Claims**

1. A device for the generation of coherent light in the wavelength range from 2000 A to 2800 A comprising an optically nonlinear crystal element of a pentaborate compound of the formula $AB_5O_8.4H_2O$, with A from the group NH_4, K, Rb, or

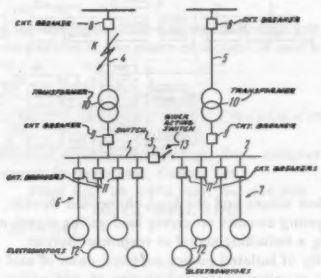


Cs, and means to illuminate said crystal element with coherent light of at least wavelength greater than 2800 A.

3,934,155
POWER SUPPLY ARRANGEMENT

Alexandr Avdeevich Galitsyn, ulitsa Osharskaya, 53, kv. 29, Gorky, U.S.S.R.

Filed Mar. 14, 1974, Ser. No. 451,156
Int. Cl.² H02H 3/00
U.S. Cl. 307—112 **2 Claims**



1. A power supply arrangement comprising: sectionalized buses; a switch sectionalizing said buses; feeders feeding the bus sections; service lines connected to said bus sections; electromotors to which said service lines are connected; a quick-acting switch means connected in series with said sectionalizing switch for coupling the buses in case of a fault in one of said feeders, said switch means being adapted to act during the first cycle of hunting of said electromotors until the phases of said electromotors are in phase opposition with another of said feeders to which the electromotors are now connected by operation of said switch means.

3,934,156
MOVEMENT RESPONSIVE CONTROL APPARATUS

Robert A. Galemmo; David S. Wilson, and Howard Burman, all of Montreal, Canada, assignors to Colonial Kinetics, Inc., Leonia, N.J.

Filed Mar. 18, 1974, Ser. No. 452,276
Int. Cl.² H01H 36/00
U.S. Cl. 307—117 **8 Claims**

1. Apparatus for reducing the consumption of power by controlling the application and removal of power to and from a plurality of load circuits in response to the movement and absence of movement of an object within a prescribed area, each of said load circuits having a load connected therein and said loads being connectable to AC power sources of different phase, comprising:

transmitter means for producing and transmitting a sound wave having a substantially constant frequency to said area;

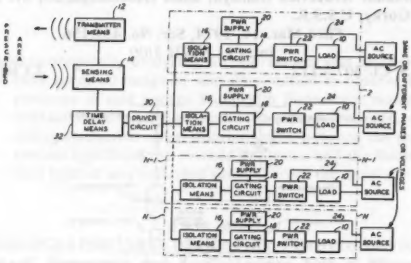
sensing means for receiving said sound wave and for producing an electrical output signal at a pair of output terminals in response to a doppler shift in the frequency

of the received sound wave caused by said movement of said object within said prescribed area;

a plurality of isolation means connected in parallal to said pair of output terminals, each of said isolation means connected in one of said load circuits intermediate said sensing means and said load connected in each of said load circuits, said isolation means isolating each of said load circuits from said sensing means and from each other, and each of said isolation means receiving said electrical output signal from said sensing means and producing a gating signal in response thereto;

a plurality of signal distribution means, each of said signal distribution means connected intermediate one of said isolation means and said pair of output terminals for evenly distributing said electrical output signal between said plurality of isolation means;

a plurality of gating circuits, each of said gating circuits connected in one of said load circuits intermediate the



isclation means and the load connected therein, each of said gating circuits receiving said gating signal and producing a switching signal in response thereto;

a plurality of isolated power supplies, each of said isolated power supplies connected to one of said gating circuits for operating said gating circuit; and

a plurality of switching means, each of said switching means connected in one of said load circuits intermediate the gating circuit and the load connected therein, said switching means receiving said switching signal and in response thereto completing an energization circuit between said load and one of said AC power sources, and upon the removal of said switching signal from said switching means, in response to said absence of movement of said object within said prescribed area and in response to the absence of any sensing of any doppler shift in said frequency of the received sound wave by said sensing means, said switching means removing said energization circuit between said load and said one of said AC power sources.

3,934,157

TTL CIRCUIT

William Joshua Evans, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 23, 1974, Ser. No. 508,081

Int. Cl.² H03K *19/08, 5/01*

U.S. Cl. 307—213 **6 Claims**

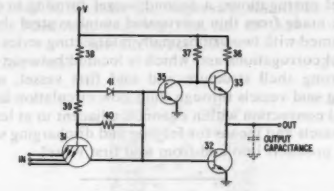
1. A logic gate comprising:

an input transistor having a base terminal, a collector terminal and at least one emitter terminal connected to an input node,

an output transistor having an emitter terminal adapted to be connected to ground, a base terminal connected directly to the collector terminal of the input transistor and a collector terminal connected to an output node,

an inverter transistor having an emitter terminal adapted to be connected to ground, a base terminal connected directly to the collector terminal of the input transistor and a collector terminal, and

a pull-up transistor having an emitter terminal connected to the output node, a base terminal connected to the collec-



tor terminal of the inverter transistor and a collector terminal.

3,934,158

SWITCHING CIRCUIT

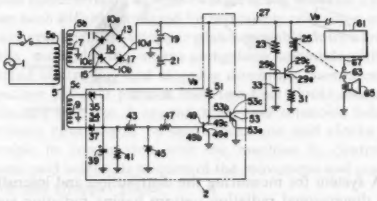
Masanobu Shinozaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Feb. 27, 1974, Ser. No. 446,320

Claims priority, application Japan, Mar. 3, 1973, 48-25562

Int. Cl.² H03K *17/00*

U.S. Cl. 307—239 **6 Claims**



1. In combination with a power amplifier having a loudspeaker, an a-c power source connected for supplying power to said power amplifier, including a power switch, a switching circuit for breaking a connection between a power amplifier and a loudspeaker upon cutting off an a-c power source by opening said power switch, which includes:

first rectifying means provided for converting a-c voltage received from said power source to a first rectified d-c voltage,

first filtering means connected to said first rectifying means and deriving said first rectified voltage therefrom for smoothing ripple variations thereof, to develop a first smoothed voltage, means supplying the first smoothed voltage to said power amplifier,

a relay control transistor connected to said first filtering means and supplied with a first preset potential therefrom to maintain the relay control transistor conductive when said power switch is closed, a relay connected to said relay control transistor controlled to make the connection when the relay control transistor remains conductive, the transition time being considerable for said first smoothed voltage to decrease below said first preset potential upon cutting off said a-c power source,

the improvement comprising:

switching means connected to said relay control transistor, said switching means including a circuit having means with a considerably short time constant in comparison with said transition time upon cutting off said a-c power source by opening of said power switch, said switching means having means controlling said first preset potential to maintain it constant while said power switch is closed and to rapidly reduce said first preset potential upon cutting off said a-c power source, which is achieved by said short time constant, including means rendering said relay control transistor non-conductive to rapidly break

said connection between said amplifier and said loudspeaker by de-energizing of said relay.

3,934,159
SEMICONDUCTOR CIRCUIT DEVICES USING INSULATED GATE-TYPE FIELD EFFECT ELEMENTS HAVING PROTECTIVE DIODES

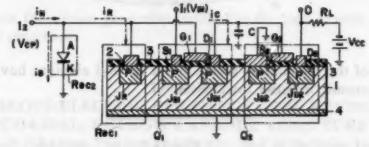
Kosei Nomiya, Tokyo; Toshihiko Kohisa, Sayama, and Isao Matsumura, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 18, 1968, Ser. No. 768,794

Claims priority, application Japan, Nov. 13, 1967, 42-72629; Nov. 13, 1967, 42-72630; Nov. 13, 1967, 42-72631; Nov. 15, 1967, 42-73055; Nov. 15, 1967, 42-73056

Int. Cl.² H03K *3/353*; H02H *7/20*

U.S. Cl. 307—304 **20 Claims**



1. In a semiconductor device comprising:

an insulated gate-type field effect component including a semiconductor substrate of first conductivity type, source and drain regions of second conductivity type opposite to said first conductivity formed in a surface of said semiconductor substrate, and an insulated gate electrode disposed on said surface between said source and drain regions and insulated from said substrate by an insulating film; and

a protecting semiconductor diode formed integrally in said substrate and connected in parallel between said insulated gate electrode and said semiconductor substrate for protecting the insulating film interposed between said gate electrode and said substrate from breakdown; the improvement comprising

auxiliary means connected with said semiconductor device for preventing minority carriers from said protecting semiconductor diode from reaching said drain region through said semiconductor substrate when noise signals are applied to the protecting diode.

3,934,160
ARRANGEMENT FOR THE PRODUCTION OF ELECTRICAL SIGNALS BY WAY OF SEMICONDUCTOR COMPONENTS WHICH ARE DEPENDENT UPON A MAGNETIC FIELD

Ulrich Von Borcke, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

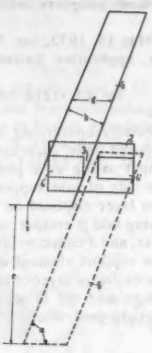
Filed June 3, 1974, Ser. No. 475,955

Claims priority, application Germany, June 12, 1973, 2329845

Int. Cl.² H01L *43/08*; H03K *17/90*

U.S. Cl. 307—309 **4 Claims**

1. An arrangement for producing electrical signals by way of semiconductor component elements which are dependent upon a magnetic field, comprising: a magent having a pair of poles, a pole piece on one of said poles, a pair of magnetic field dependent semiconductor component elements arranged next to each other and spaced apart upon said pole piece, an iron member movable over said component elements, said iron member having a projection width onto the longitudinal plane of the magnetic field dependent elements which is at least equivalent to the length of the diagonal of a magnetic field dependent element, said iron member being inclined with respect to said magnetic field dependent component elements in its longitudinal direction with respect to the longitudinal direction of said elements lying at an angle which is sufficient to provide complete coverage of one of said elements while the other of said elements remains uncovered, the longitudinal



plane of the magnetic field dependent component elements positioned parallel to the plane of motion of said iron part.

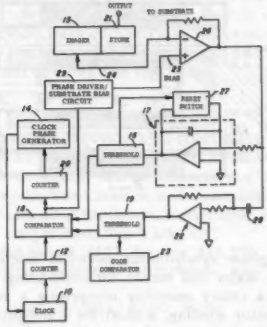
3,934,161
ELECTRONIC SHUTTER FOR A CHARGE-COUPLED IMAGER

John Millard Caywood, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1974, Ser. No. 465,198

Int. Cl.² H01L *31/08*

U.S. Cl. 307—311 **19 Claims**



1. An electronic shutter for a charge-coupled imager which comprises, in combination:

a. a charge-coupled imager comprising a substrate of semiconductor material of predetermined conductivity type, an insulating layer on a surface of said substrate, and plural transfer electrodes over said insulating layer such that radiation incident on said imager causes generation of minority carrier-majority carrier pairs in said substrate for storage of minority-carrier charge beneath said transfer electrodes during an integration period;

b. storage means coupled to said imager; and

c. means electrically connected to said substrate for responding to current flow induced by said majority carriers to cause transfer to said storage means of said minority carrier induced charge stored beneath said transfer electrodes and for terminating said integration period, at a predetermined level of said current.

3,934,162

MINIATURIZED NUCLEAR BATTERY

Karl Adler, Grenchen, and Georges Ducommun, Feldbrunnen, both of Switzerland, assignors to Biviator, S.A., Grenchen, Switzerland

Filed May 15, 1973, Ser. No. 360,565
Claims priority, application Switzerland, May 26, 1972, 7798/72
Int. Cl. G21d 7/00
U.S. Cl. 310—3 A 27 Claims

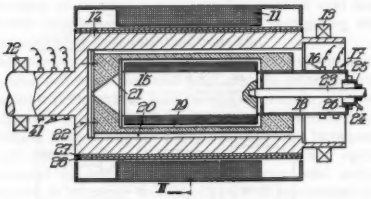
1. A nuclear battery comprising a plurality of in series connected, superposed cells, each cell including a generally flat support element acting as a positive pole, a β-emitter supported on one side of said support element, a radiation resisting insulation layer disposed on said support layer and completely overlying said β-emitter, an absorption layer atop said insulation layer, and a collector layer atop said absorption layer, wherein the support element of each superposed cell lies directly on the collector layer of its subjacent cell without space between them and the in series connected cells are disposed in an airtight case where a compact battery is obtained.

3,934,163

POLYPHASE SYNCHRONOUS ELECTRICAL MACHINE WITH SUPERCONDUCTOR WINDING

Alain Mailfert, Morsang-sur-Orge, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Feb. 15, 1974, Ser. No. 443,015
Claims priority, application France, Feb. 21, 1973, 73.06119
Int. Cl.² H02K 19/00
U.S. Cl. 310—10 10 Claims



1. Polyphase synchronous electrical machine comprising polyphase stator coil means for conducting A.C. armature currents, a rotary assembly comprising a superconducting D.C. inductor winding, a shaft for transmitting mechanical power and polyphase auxiliary windings for providing a rotary field when conducting polyphase A.C. currents and circuit means for circulating, in response to unbalance of said polyphase armature currents, currents in said auxiliary windings to create a rotating magnetic field of such amplitude as to substantially compensate for the low frequency variations of the armature reaction field in unbalanced operation.

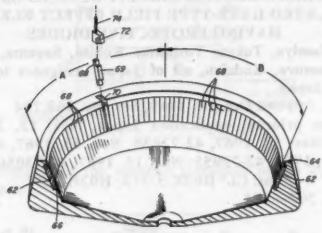
3,934,164

X-RAY TUBE HAVING COMPOSITE TARGET

Martin Braun, Stamford, and Joseph R. Suffredini, Darien, both of Conn., assignors to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Feb. 14, 1975, Ser. No. 550,236
Int. Cl.² H01J 35/10
U.S. Cl. 313—60 20 Claims

13. An X-ray target of the rotating type comprising:
a cup-shaped body having an inner wall surface; and an annular focal track disposed on the inner wall surface and including a composite material made of an element



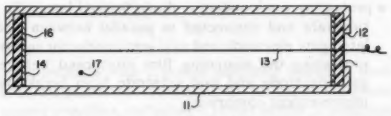
of the lanthanide series and a second element having an atomic number lower than 57.

3,934,165

PROPORTIONAL COUNTER END EFFECTS ELIMINATOR

John F. Meekins, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1974, Ser. No. 518,115
Int. Cl.² H01J 39/26, 39/29
U.S. Cl. 313—93 3 Claims



1. An improved proportional counter including a gas filled cathode housing with a coaxially disposed anode and an insulator substrate at each end of said housing, the improvement comprising;
a resistor conductor network of resistive material deposited upon said substrate at each end of said counter on the inner surface of each of said substrates with the ends of said resistive material secured electrically to the cathode and anode,
where the resistor-conductor network obeys the formula

$$\theta = \sqrt{\left(\frac{b}{r}\right)^2 - 1} - \mathrm{Cos}^{-1}\left(\frac{r}{b}\right)$$

where b is the inner radius of the counter body, r is the radial distance from the center of the anode, and θ is the angle in radians.

3,934,166

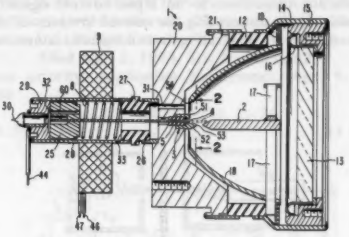
OFFSET STINGER FOR ARC LAMP

William R. Stuart, San Carlos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 424,399, Dec. 13, 1973. This application Aug. 23, 1974, Ser. No. 500,204
Int. Cl.² H01J 1/02, 1/44, 1/52, 1/88
U.S. Cl. 313—146 7 Claims

1. An arc lamp electrode comprising a generally cylindrical metal structure, with a bore extending from one end thereof into the interior of said structure, said one end having a face

circumferentially surrounding said bore, said face being generally planar except for an integral portion thereof which



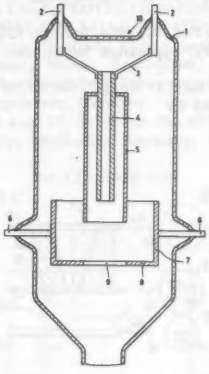
projects therefrom generally parallel to the axis of said cylindrical structure.

3,934,167

GASEOUS ELECTRIC DISCHARGE TUBE HAVING A COAXIAL, HOLLOW CATHODE STRUCTURE

Gijsbert Johannes Ponsen, Eindhoven, and Wilhelmus Jacobus Witteman, Geldrop, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 332,121, Feb. 13, 1973, abandoned.
This application Oct. 1, 1974, Ser. No. 511,077
Claims priority, application Netherlands, Apr. 24, 1970, 7005965
Int. Cl.² H01J *61/067, 61/12*; H01S *3/02*
U.S. Cl. 313—185 3 Claims



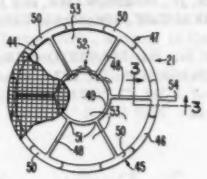
1. In a discharge tube having an anode and a cathode the improvement which comprises a generally cylindrical cathode having disposed thereabout in coaxial relationship a generally cylindrical auxiliary anode, said auxiliary anode having a diameter greater than said cathode and disposed with a first axial end portion overlapping a first axial end portion of said cathode, said auxiliary anode having an axial portion extending closer to the anode than said cathode to provide shielding for said cathode, said discharge tube being provided with an argon filling at a pressure between 0.05 and 5 Torr at a cathode current in the order of tenths of amperes, said cathode being non-activated and comprising inner and outer tubes of a material selected from the group consisting of tantalum and tungsten, said inner and outer tubes being disposed in coaxial relationship with at least a first axial extremity of said outer tube overlapping a first axial extremity of said inner tube, said inner and outer tubes being open at said first axial extremity which faces the discharge, the first axial extremity of said inner tube ending within the first axial extremity of the outer tube and the outer tube being carried on the circumference of the inner tube, and means for supporting said inner tube carried on said discharge tube.

3,934,168

GRID SUPPORT MEANS FOR A PLANAR TUBE

Wendell G. Hardman, and Werner Brunhart, both of Salt Lake City, Utah, assignors to Varian Associates, Palo Alto, Calif.

Filed July 18, 1974, Ser. No. 489,690
Int. Cl.² H01J *1/46, 21/10*
U.S. Cl. 313—293 9 Claims



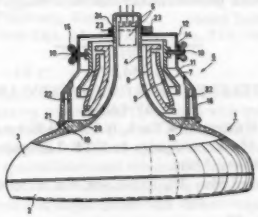
1. An electron tube comprising; an envelope, a plurality of substantially planar and parallel electrodes, support means for said electrodes, and means for electrical connection to said electrodes, said electrodes comprising an electron emissive cathode, an electron collective anode, and at least one electron permeable grid between said cathode and said anode, said grid comprising a circular frame and an array of spaced wires, said frame comprising an outer rim interconnected with a web of support elements, said support elements having cross sections larger than said wires, said web having planar faces parallel to said cathode, said support elements comprising a plurality of radial elements connected to said rim and interconnected by non-radial elements lying entirely within said rim to form at least three enclosed apertures within said rim, said array of wires being joined to the face of said web facing said cathode, and covering said apertures.

3,934,169

PICTURE DISPLAY DEVICE AND DEFLECTION COIL BOTH HAVING SELF-ALIGNING SURFACES

Adriaan Jacob Groothoff; Martin Clemens van der Heijde; Johannes Aloysius Van Leeuwen, and Constantius Johannes Waltherus Panis, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,376
Claims priority, application Netherlands, Aug. 20, 1973, 7311430
Int. Cl.² H01J *63/02, 29/54*
U.S. Cl. 313—477 11 Claims



1. A picture display device tube having a longitudinal axis and comprising a conical central part, a neck mounted on said central part, means for generating at least one electron beam disposedin said neck, and means disposed on said central part

for self centering a deflection coil supporting cage with respect to the longitudinal axis of said tube, the said centering means comprising a centering edge integrally formed with the conical central part of the tube and which is disposed coaxially around the longitudinal axis of the tube, the centering edge having a centering surface which is conical relative to the longitudinal axis, the angle enclosed by the centering surface of the centering edge and the longitudinal axis is smaller than the angle enclosed by the one surface at the area of the centering edge and the longitudinal axis.

3,934,170

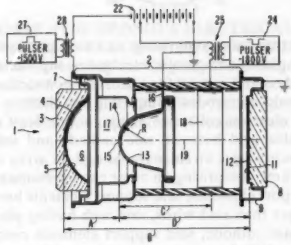
IMAGE TUBE AND METHOD AND APPARATUS FOR GATING SAME

Richard S. Enck, Jr., Mountain View, and James P. Sackinger, San Jose, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 189,973, Oct. 18, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,190

Int. Cl.² H01J *29/70*

U.S. Cl. 315—12 **12 Claims**



1. In an electron image tube, a photocathode disposed to receive a photon image for emitting into the tube an electron image corresponding to the received photon image, an output means spaced from said photocathode for receiving the emitted electron image, an accelerating anode electrode means interposed between said photocathode and said output means for accelerating and converging the image electrons, said anode means containing a central aperture small compared to said photocathode for passing said converged image electrons from said photocathode and focussing said electron image upon said output means, gating electrode means adjacent said output means for gating the electron image to said output means, said gating electrode means being radially spaced outside said electron image and means for periodically pulsing the potential difference between said gating electrode and said photocathode such that the potential of said gating electrode periodically becomes sufficiently negative with respect to the potential of said photocathode that said image electrons are returned to said anode.

3,934,171

DOUBLE GRID ELECTRON GUN SYSTEM AND METHOD OF USE

Rudolf G. E. Hutter, New York, N.Y., and Herman O. Dressel, Lynnfield, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 28, 1974, Ser. No. 473,540

Int. Cl.² H01J *29/52*

U.S. Cl. 315—30 **5 Claims**

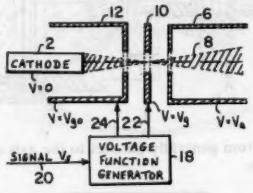
1. An electron gun system comprising

A. a cathode for emitting an electron beam,

B. an accelerating grid having a positive grid having a positive voltage impressed thereon with respect to the cathode for accelerating the electron beam,

C. first and second control grids located in the path of the electron beam between the cathode and the accelerating grid, and

D. means responsive to an input control signal bearing information concerning the desired intensity of the electron beam for generating first and second control voltages



both bearing said information and for respectively applying the first and second control voltages to the first and second control grids,

whereby the first and second control grids jointly control the intensity of the electron beam emitted from the cathode.

3,934,172

FLAT DISCHARGE PANEL USING D.C. DISCHARGE, AND METHOD OF DRIVING THE SAME

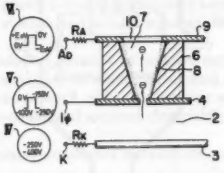
Yukio Okamoto, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 12, 1974, Ser. No. 532,176

Claims priority, application Japan, Dec. 12, 1973, 48-137782

Int. Cl.² H01J *17/04, 61/06*

U.S. Cl. 315—169 TV **10 Claims**



1. A flat discharge panel comprising:

a plurality of cathodes which are parallel to one another;

a plurality of parallel intermediate electrodes the projection of each of which intersects said cathodes, each of said intermediate electrodes having priming holes respectively corresponding to its projection upon said cathodes;

parallel anodes which are disposed on the sides of said intermediate electrodes remote from said cathodes in a manner to be respectively parallel to said cathodes;

auxiliary discharge spaces provided for the corresponding cathodes and each of which is common to said intermediate electrodes;

main discharge spaces provided in said anodes in correspondence with the respective priming holes in said intermediate electrodes; and

a gas which is hermetically contained in said main and auxiliary discharge spaces.

3,934,173

CIRCUIT ARRANGEMENT FOR GENERATING A DEFLECTION CURRENT THROUGH A COIL FOR VERTICAL DEFLECTION IN A DISPLAY TUBE

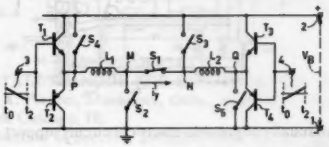
Jan Abraham Cornelis Korver, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,563

Claims priority, application Netherlands, Apr. 9, 1973, 7304886

Int. Cl.² H01J 29/70, 29/76

U.S. Cl. 315—408 **11 Claims**



1. A circuit for generating from a direct voltage source a sawtoothed shaped current having trace and retrace intervals through a coil having two halves, said circuit comprising an amplifier having an input means for receiving control signals and an output terminal, means for coupling said coil to said terminal, and switching means for coupling said coil halves in series with one another during said trace interval and for coupling each of said coil halves to said direct voltage source during said retrace interval.

3,934,174

SURGE VOLTAGE PROTECTION FOR TRANSFER SWITCHES FOR LOAD-TAP CHANGERS

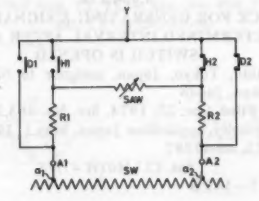
Alexander Bleibtreu; Wolfgang Breuer, both of Regensburg, and Hans-Henning Mieske, Tegernheim, all of Germany, assignors to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G., Regensburg, Germany

Filed Aug. 15, 1974, Ser. No. 497,606

Claims priority, application Germany, Nov. 16, 1973, 2357209

Int. Cl.² G05F 1/14

U.S. Cl. 317—11 C **2 Claims**



1. In a transfer switch for load-tap changers the combination of

a. a pair of terminals for connecting the contact means of the transfer switch to a pair of taps of a tapped transformer winding;

b. a pair of relatively movable switch-over contact means each arranged to connect selectively each of said pair of terminals to an outgoing load-current-carrying line;

c. a pair of switch-over resistors each interposed between one of said pair of terminals and one of said pair of switch-over contact means;

d. a pair of relatively movable current-carrying contact means each shunted across one of said pair of switch-over contact means to connect selectively each of said pair of terminals directly with said outgoing load-current-carrying line;

e. a tank with a body of insulating fluid therein housing said pair of switch-over contact means and said pair of current-carrying contact means; and

f. a non-linear surge voltage protective resistor arranged inside said tank submersed in said body of insulating fluid and interconnecting the ends of said pair of switch-over resistors remote from said pair of terminals and adjacent said pair of switch-over contact means so that in case of breakdown of said surge protective resistor the current resulting from a voltage applied across said pair of terminals is limited by said pair of switch-over resistors.

3,934,175

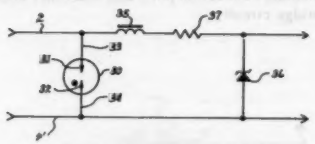
POWER SURGE PROTECTION SYSTEM

Oscar M. Clark, Tempe, Ariz., assignor to General Semiconductor Industries, Inc., Tempe, Ariz.

Continuation-in-part of Ser. No. 420,850, Dec. 3, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,690

Int. Cl.² H02H 9/06

U.S. Cl. 317—16 **10 Claims**



1. A surge suppressor for dissipating power surges impressed upon an electrical line, said suppressor comprising:

a. means for dissipating the bulk of the energy for a power surge on the electrical line, said dissipating means having an electrode connected to the electrical line;

b. an avalanche semiconductor element connected in parallel with said dissipating means, said avalanche semiconductor element clipping the remaining energy of the power surge impressed upon the electrical line;

c. a delay line comprising a series connected inductor and resistor for preventing said avalanche semiconductor element from clamping said dissipating means, said delay line being disposed intermediate said electrode of said dissipating means and said avalanche semiconductor element; whereby the bulk of the power surge impressed upon the electrical line is dissipated by said dissipating means and the remainder of the power surge is clipped by said avalanche semiconductor element.

3,934,176

SAFETY APPARATUS FOR ASSURING PROPER GROUNDING OF MINING MACHINERY OR THE LIKE

Karappurath Vasudevan, Pittsburgh, Kans., and David J. Sloop, St. Ann, Mo., assignors to Atkinson Armature Works Co., Inc., Pittsburg, Kans.

Filed Oct. 16, 1974, Ser. No. 515,168

Int. Cl.² H02H 3/16

U.S. Cl. 317—18 C **5 Claims**

1. Safety control apparatus for use with an electric system of the class having a power unit provided with means presenting a source of electrical power available for distribution, means providing an electrical ground at the power unit, a working unit spaced from and moveable relative to the power unit which requires electrical coupling with said ground for safety purposes and is provided with means requiring electrical power for operation thereof, cable means extending between said units and provided with a grounding conductor for coupling said ground with the working unit, a pilot conductor and power conductors for coupling said power source presenting means at the power unit with said power requiring means at the working unit, a resistance component coupled between

the ends of said grounding and pilot conductors at the working unit, and electrically controllable power switching means at the power unit for interrupting the coupling of said power conductors to the power source presenting means, said apparatus including:

a resistance measuring bridge circuit having a pair of opposed end-points, a pair of opposed mid-points, an arm between each end-point and each mid-point respectively, and means applying a direct current voltage across said end-points;

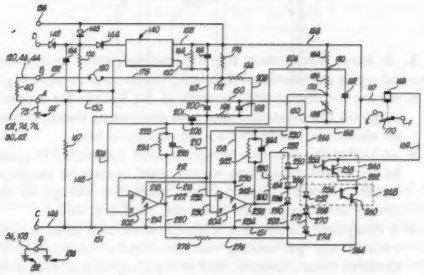
a first resistance component coupled in the arm of the bridge circuit between one end-point and one mid-point thereof;

means coupling the ends of said pilot and grounding conductors at the power unit with said one mid-point and the other end-point of said bridge circuit respectively;

an intermediate connection point in the arm of said bridge circuit between said one end-point and the other mid-point thereof;

a second resistance component coupled between said one end-point and said intermediate connection point and said other mid-point of said bridge circuit;

a third resistance component coupled between said intermediate connection point and said other mid-point of said bridge circuit;



a fourth resistance component coupled between said intermediate connection point and said other end-point of the bridge circuit;

first voltage comparator means having a pair of input terminals and an output terminal and adapted to produce at said output terminal a comparison result output dependent upon the relationship between electrical potentials applied to said input terminals thereof;

second voltage comparator means having a pair of input terminals and an output terminal and adapted to produce at said output terminal a comparison result output dependent upon the relationship between electrical potentials applied to said input terminals thereof;

means electrically coupling said one mid-point of said bridge circuit with one input terminal of each of said comparator means;

means electrically coupling said intermediate connection point of said bridge circuit with the other input terminal of said first comparator means;

means electrically coupling said other mid-point of said bridge circuit with the other input terminal of said second comparator means; and

control means operably coupled with said output terminals of said first and second comparator means and with said power switching means for controlling the latter in response to said comparison result outputs.

3,934,177

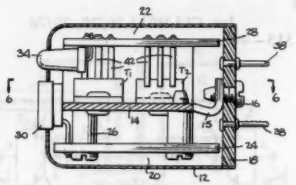
HEAT SINK CASING FOR CIRCUIT BOARD COMPONENTS

Stephen Horbach, 40 Glen Road, Mountain Lakes, N.J. 07046

Filed Jan. 9, 1975, Ser. No. 539,870

Int. Cl.² H05K 7/20

U.S. Cl. 317—100 **12 Claims**



1. A manually adjustable electrical circuit support structure comprising:

a case,

a channel-shaped bracket having a main wall and two side walls, said main wall extending longitudinally and laterally through said case to divide the interior of said case into substantially first and second chambers, said side walls extending along attached to the inner walls of said case in thermal contact with said walls of said case,

a processing first circuit board spaced from said bracket and within said first chamber, said circuit board being mechanically supported by said bracket,

a second circuit board within said second chamber and mechanically supported by said bracket,

power transistors connected with said second circuit board said power transistors mounted directly on said bracket in said second chamber and in thermal contact with said bracket, said bracket acting as a heat sink for said transistors, and

a variable electrical element connected to said first circuit board, said variable element operable through an opening in a wall of said case to permit user adjustment of the electrical parameter of said element, a surface of said element bearing on an edge of said main bracket, said main bracket preventing said element from being pushed into said case.

3,934,178

DEVICE FOR GENERATING A SIGNAL FOR A PREDETERMINED INTERVAL AFTER A POWER SWITCH IS OPENED

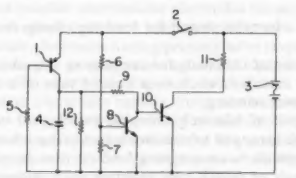
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 23, 1974, Ser. No. 463,246

Claims priority, application Japan, May 1, 1973, 48-47586; May 1, 1973, 48-47587

Int. Cl.² H01H 47/18

U.S. Cl. 317—141 S **6 Claims**



1. A circuit for generating a signal for a predetermined time interval after a power switch is opened, comprising a power switch, a capacitor coupled to be charged by current from a power source only when said power switch is closed, a transis-

tor having a control electrode, and having a pair of principal conducting electrodes, means for applying a terminal voltage of said capacitor to said transistor control electrode to render said transistor conductive for a predetermined time interval after said power switch is opened, and a latching relay having first and second coils, having switch means biased in a first switch position when the first coil is energized and biased in a second switch position when the second coil is energized, and having means for supplying current alternately to the first and the second coils when the power switch is closed, wherein said second coil is connected in series with said principal conducting electrodes of said transistor and supplied with current through said transistor when the power switch is opened.

3,934,179

TANTALUM ANODE FOR ELECTROLYTIC DEVICES

James A. Pierret, Muskogee, Okla., assignor to Fansteel Inc., North Chicago, Ill.

Continuation of Ser. No. 290,624, Sept. 20, 1972, which is a division of Ser. No. 132,075, April 7, 1971, abandoned, which is a continuation of Ser. No. 756,357, Aug. 30, 1968, abandoned, which is a division of Ser. No. 701,870, Jan. 31, 1968, Pat. No. 3,418,106, which is a continuation-in-part of Ser. No. 369,039, May 17, 1967, abandoned. This application Mar. 5, 1975, Ser. No. 555,377

Int. Cl.² H01G *9/00*

U.S. Cl. 317—230 **16 Claims**

1. A pressed and sintered compact for use as a tantalum anode in electrolytic devices formed from a pressed compact of agglomerated tantalum ingot-hydride powder having a green density no greater than about 8 g./c. and sintered at a temperature of about 2,000°C for a period of about 30 minutes, said pressed and sintered anode exhibiting a specific capacity of at least 2,700 microfarad-volts per gram when formed to 200 volts in a 0.01 percent solution of phosphoric acid at 90°C at a constant current of 35 ma. per gram and when tested at full charge at 140 volts in a 0.01 percent solution of phosphoric acid.

3,934,180

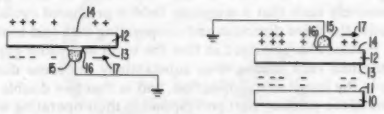
METHOD OF REPRODUCING AN ELECTROSTATIC CHARGE PATTERN IN INTENSIFIED FORM

Helmut Gustav Kiess, Zurich, Switzerland, and Albert Rose, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,717

Int. Cl.² G03G *13/00*

U.S. Cl. 317—262 A **5 Claims**



1. A method of reproducing, on an electrically insulating film, an electrostatic charge pattern in an intensified form conforming substantially in configuration to an original monopolar electrostatic charge pattern on an electrically insulating image-bearing surface, said method comprising the steps of:

a. placing one surface of said film into an area of influence of said original monopolar electrostatic charge pattern on said image-bearing surface,

b. applying momentarily a source of charge migration to all areas of the other surface of said film, whereby to induce on said other surface a monopolar electrostatic charge pattern of opposite polarity to that of the original monopolar electrostatic charge pattern,

c. removing said film from said image-bearing surface and applying momentarily a source of charge migration to said one surface of said film, whereby to induce an electrostatic charge pattern of the same polarity as that of said original monopolar electrostatic charge pattern thereon and to provide said film with a bipolar charge,

d. disposing said one surface of said film adjacent to said image-bearing surface so that the electrostatic charge patterns thereon of the same polarities are in register with each other, and,

e. applying momentarily a source of charge migration to all areas of said other surface of said film, whereby to induce on said other surface a monopolar electrostatic charge superimposed on said bipolar charge.

3,934,181

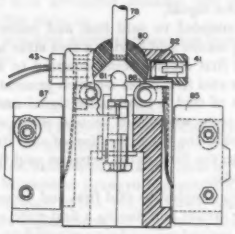
SOLID STATE LIGHT RESPONSIVE CONTROL SYSTEM

Ben J. Rosenthal, 9140 Kildare, Skokie, Ill. 60076

Continuation-in-part of Ser. No. 315,791, Dec. 17, 1972. This application Jan. 15, 1974, Ser. No. 433,549

Int. Cl.² B62D *11/04*

U.S. Cl. 318—53 **15 Claims**



1. A control system, including in combination:

light supply means;

a plurality of light responsive means having an electrical characteristic which changes with the light applied thereto;

electrical drive means operable in various modes in accordance with the electrical current applied thereto;

circuit means coupled to said light responsive means and to said drive means for supplying an electrical signal to said drive means which varies with the magnitude of light striking said light responsive means from said light supply means; and

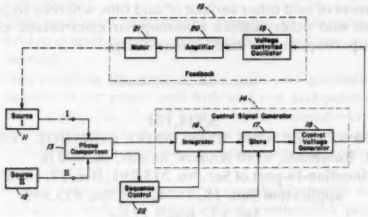
mounting and masking means comprising a support defining a spherical receptacle surface portion and supporting said light responsive means in fixed spaced relationship adjacent said spherical receptacle surface, mask means comprising a spherical insert surface portion mounted within said spherical receptacle surface portion for universal movement relative thereto, said mask means defining a cavity within said spherical insert surface which receives light from said light supply means,

said spherical surface portions having areas of differing light transmitting characteristics which are in overlying relationship and shaped to cooperatively control the amount of light striking said light responsive means as a function of the relative positions of said cooperating spherical surface portions.

3,934,182
SYNCHRONIZING APPARATUS

James M. Donohue; Joseph R. Kramer, and Victor Rodek, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1970, Ser. No. 89,869
Int. Cl.² H02P 5/50
U.S. Cl. 318—85 4 Claims



1. Apparatus for synchronizing the time of occurrence of a first pulse signal with the time of occurrence of a second pulse signal comprising:

first pulse signal generating means for generating said first pulse signal;

second pulse signal generating means for generating said second pulse signal;

first means coupled to said first and second pulse signal generating means and having a first state and a quiescent state, said first means being adapted to assume its first state when said first pulse signal is generated prior to the generation of said second pulse signal and to assume its quiescent state when said second pulse signal is generated, whereby the time duration of said first state is proportional to the time delay between said first and second pulse signals;

second means coupled to said first and second pulse signal generating means and having a first state and a quiescent state, said second means being adapted to assume its first state when said second pulse signal is generated prior to said first pulse signal and to assume its quiescent state when said first pulse signal is generated, whereby the time duration of said first state is proportional to the time delay between said second and first pulse signals;

first integrating means coupled to said first means for producing a first analog signal having an amplitude proportional to the integral of the time duration of the first state assumed by said first means;

second integrating means coupled to said second means for producing a second analog signal having an amplitude proportional to the integral of the time duration of the first state assumed by said second means;

first storage means coupled to said first integrating means for storing the maximum amplitude obtained by said first analog signal;

second storage means coupled to said second integrating means for storing the maximum amplitude obtained by said second analog signal;

combining means coupled to said first and second storage means for selectively producing a control signal above a predetermined threshold level in response to the maximum amplitude stored by said first storage means and below said predetermined threshold level in response to the maximum amplitude stored by said second storage means;

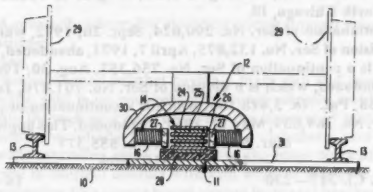
voltage controlled oscillating means coupled to said combining means for producing an oscillating signal having a frequency of oscillation determined by said control signal; and

modifying means coupled to said first pulse signal generating means and responsive to said oscillating signal for modifying the time of occurrence of said first pulse signal in accordance with the frequency of oscillation of said oscillating signal whereby the magnitude of said control signal obtains said predetermined threshold level.

3,934,183
LINEAR RELUCTANCE MOTOR FOR THE PROPULSION OF RAIL TRANSPORTATION MEANS

Helmut Säufferer, Esslingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 200,088, Nov. 18, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 434,968
Claims priority, application Germany, Nov. 18, 1970, 2056674
Int. Cl. H02k 41/02
U.S. Cl. 318—135 20 Claims



1. A linear electric motor for the drive of rail transporting means, which comprises a primary part including at least one group of four double coil means, each double coil means of said group arranged one adjacent the other, a magnetic yoke joining each double coil means, and means for simultaneously feeding each double coil means with an alternating current, said group of double coil means disposed in said rail transporting means longitudinally in the drive direction; a rail-like secondary part disposed fixedly on the ground and substantially parallel to track of said rail means, said secondary part including a toothed rack means having teeth of ferromagnetic material and tooth gaps, with substantially the same dimensions in the longitudinal direction, disposed along said toothed rack means in the longitudinal direction, wherein each said double coil means of said group is disposed with one coil oppositely positioned on either side of said rack means, the axis of each coil of said double coil means being in line with one another and perpendicular to said rack means, and wherein said group of four double coil means corresponds in its operating width to the longitudinal dimensions of one tooth and one tooth gap of said rack means; and means for energizing pulse-wise each said double coil means of said group successively such that a magnetic field is produced cyclically opposite the drive direction and cooperating with said toothed rack means, characterized in that the teeth and tooth gaps of the toothed rack means have substantially the same dimensions in the longitudinal direction, and in that two double coil means of the primary part correspond in their operating width to the longitudinal dimensions of a tooth or tooth gap.

3,934,184
ARRANGEMENT FOR REGULATING THE SPEED OF AN ASYNCHRONOUS MOTOR

Heinrich Bönig, Erlangen, and Hermann Waldmann, Weiher, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

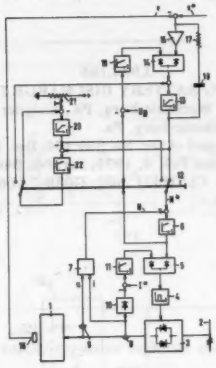
Filed July 26, 1973, Ser. No. 382,883
Claims priority, application Germany, Aug. 14, 1972, 2239897
Int. Cl.² H02P 5/40
U.S. Cl. 318—227 6 Claims

1. An arrangement for regulating the speed of an asynchronous motor which is supplied with power at a constant fre-

quency and has associated with it a multi-loop regulating circuit comprising:

a. regulating means including means to develop from a commanded speed and actual speed, a first control signal;

b. means for measuring the real power being consumed by the asynchronous motor and providing a signal proportional thereto;



c. an real performance regulator including means to develop from said first control signal and from said signal proportional to the real power a second control signal; and

d. means responsive to said second control signal to control one of the voltage and current being supplied to the motor.

3,934,185

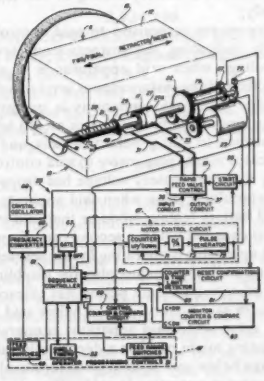
MACHINE TOOL CONTROL SYSTEM

Stanley C. Schoonover, and Harrel, Jack D., both of Waynesboro, Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Continuation of Ser. No. 322,468, Jan. 10, 1973, abandoned. This application May 30, 1974, Ser. No. 474,553

Int. Cl.[2] G05B *23/00, 19/00*

U.S. Cl. 318—565 **3 Claims**



1. A machine tool control system comprising

a machine element,

means for advancing said machine element including a stepping motor, and

means for supplying a selected number of pulses to said stepping motor to advance said machine element from a retracted position within a predetermined zone, defined by a predetermined number of pulses, to an advanced position,

means for retracting said machine element including said stepping motor, and

means for supplying said selected number of pulses at a predetermined rate to said stepping motor,

reset confirmation means,

means for supplying pulses, representative of the actual position of said machine element to said reset confirmation means as said machine element is retracted from said advanced position to said retracted position,

timer means selectively set to time out after a time selected to correspond to the time required for said predetermined number of pulses plus one to be supplied to said reset confirmation means,

means for energizing said timer means when said machine element has been retracted to the proximate edge of said zone,

means for ascertaining whether said machine element is located within said zone when said timer times out, and

means for disabling said advancing means

when said machine element retraction terminates intermediate said advanced position and said proximate edge of the zone, or

when said machine element retraction terminates beyond said zone.

3,934,186

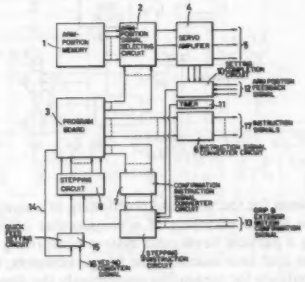
PROGRAM CONTROL SYSTEM FOR ROBOTS FOR INDUSTRIAL USE

Kyohei Hayakawa, and Hiroshi Maeda, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 232,441, March 7, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 407,909

Int. Cl.[2] G05B *19/10, 19/30, 19/18*

U.S. Cl. 318—567 **6 Claims**



1. A program control system for use with an industrial robot having an arm for performing predetermined manipulations, said arm capable of grip control and said robot also capable of motion external to said arm, said system comprising:

memory means for determining arm position;

pin-board type means for programming the sequence of operations for said robot;

arm-position selecting means responsive to said memory means and programming means for supplying preselected servo control signals;

servo means responsive to said servo control signals for moving said arm, feedback signals being generated by said arm in response thereto;

comparator means responsive to feedback signals from said arm for detecting coincidence with said memory means;

means responsive to said programming means for generating arm grip and exterior motion instruction signals, grip and exterior motion confirmation signals being received from said robot in response thereto;

means responsive to said grip and exterior motion confirmation signals and to said comparator means and programming means for confirming that confirmation signals and comparator means output come within predetermined limits;

stepping means responsive to said confirmation means for advancing the programming means from one step to another; and

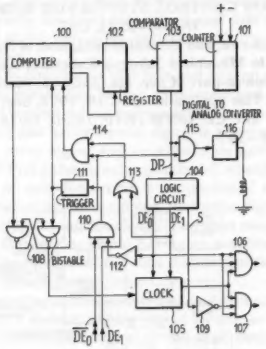
means for detecting those positions of said pinboard memory with inserted pins and those without pins, said stepping means for performing normal stepping operations corresponding to pin-inserted positions, and including jumping means for jumping positions without pin insertion.

3,934,187

DEVICE FOR THE ACCURATE POSITIONING OF AN OBJECT HOLDER IN RELATION TO THE ELEMENTS OF A PARTICLE-TYPE OPTICAL SYSTEM, AND A PARTICLE-TYPE OPTICAL SYSTEM EQUIPPED WITH SAID DEVICE

Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 27, 1974, Ser. No. 446,504
Claims priority, application France, Mar. 2, 1973, 73.07540
Int. Cl.² G05B *1/06*
U.S. Cl. 318—640 **6 Claims**



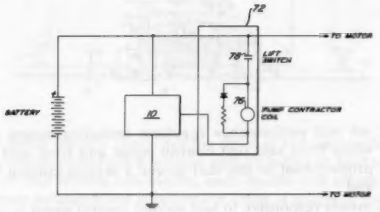
1. A system for the accurate positioning of a sample holder, in relation to the elements of a corpuscular optical system producing a particle beam, this system comprising two interferometers and two interference fringe counters, having respective outputs for measuring respectively the displacements of said sample holder in two mutually perpendicular directions, said system comprising in combination, for each of said directions: a digital comparator having two inputs and one output, a register recording the position required by a computer, said two inputs of said comparator being respectively connected to said counter output and said register output,; a logic circuit having an input connected to said comparator output, and three two state outputs, each of said two state outputs delivering respectively two logic voltage levels corresponding respectively to states "0" and "1", the state of said first input being significant of the sign of the correction to be made, a motor, a motor controlling speed device, for giving two said motor one of said direction and first and second predetermined speeds and for stopping said motor, said controlling device having a first and a second control input respectively connected to said second and said third output of said logic circuits and giving to said motor said first speed when both said outputs of said logic circuit are in the state 1, said second speed when only said third input is in state "1" and stopping said motor when both said outputs are in the "0" state, said respective states of said outputs being significant of the amplitude of the correction to be effected; said first output of said controlling device controlling the rotation direction of said motor.

3,934,188

SELF-TESTING BATTERY DISCHARGE INDICATOR

Robert A. York, Mechanicsburg, Pa., assignor to Flight Systems, Inc., Mechanicsburg, Pa.

Continuation-in-part of Ser. No. 536,134, Dec. 24, 1974. This application Feb. 4, 1975, Ser. No. 546,960
Int. Cl.² H02J *7/00*; G08B *21/00*
U.S. Cl. 320—48 **19 Claims**



1. Apparatus for indicating the voltage level of a battery and for disabling a load connected to the battery, comprising:

means for generating a control signal which is representative of the battery voltage when a first signal representative of the battery voltage is applied to said generating means and which is representative of an independent voltage which decreases at a fixed rate when said second signal representative of said independent voltage is applied to said generating means;

means for selectively applying either said first signal or said second signal to said generating means so as to operate said apparatus in a battery testing or self-testing mode, respectively;

first indicator means responsive to said control signal for continually indicating the instantaneous level of said battery voltage when said apparatus is in said battery testing mode and the instantaneous level of said independent voltage when said apparatus is operating in said self-testing mode, said first indicator means being electrically connected to said generator means; and

second indicator means responsive to said control signal for indicating that said battery voltage has dropped below a first predetermined value when said apparatus is operating in said battery testing mode or that said independent voltage has dropped below a second predetermined value when said apparatus is operating in said self-testing mode, said second indicator means also for disabling the load after a predetermined time period has elapsed following a decrease in said battery voltage below said first predetermined value when said apparatus is operating in said battery testing mode or after a decrease in said independent voltage below said second predetermined level when said apparatus is operating in said self-testing mode, said second indicator means being electrically connected to said generator means.

3,934,189

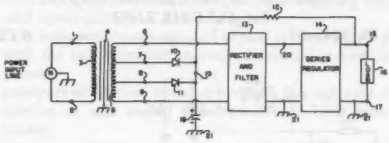
POWER SUPPLY REGULATOR HIGH-LINE SHUNT BYPASS

Alfred H. Schamel, West Linn, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 333,812, Feb. 20, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,195

Int. Cl.² H02M 7/02

U.S. Cl. 321—11 10 Claims



1. A power supply regulator high-line shunt bypass circuit comprising:

a first voltage source means;

a second voltage source means of relatively higher magnitude than said first voltage source means, each of said voltage source means adapted for energization by a changing primary voltage;

output terminals;

resistance means having a value of resistance substantially higher than that of conductive wire connected between said first voltage source means and said output terminals for coupling a first voltage from said first voltage source means to said output terminals only when said first voltage source means is energized; and

voltage regulating means coupled between said second voltage source means and said output terminals for coupling a second voltage from said second voltage source means to said output terminals when said second voltage source means is energized and for coupling at least a portion of said second voltage to said output terminals when said first voltage source means is energized.

3,934,190

SIGNAL COMPRESSORS AND EXPANDERS

Ray Milton Dolby, London, England, assignor to Dolby Laboratories, Inc., New York, N.Y.

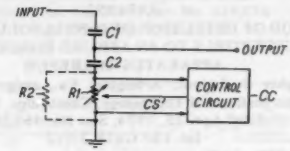
Continuation of Ser. No. 395,280, Sept. 7, 1973. This application Oct. 31, 1974, Ser. No. 519,631

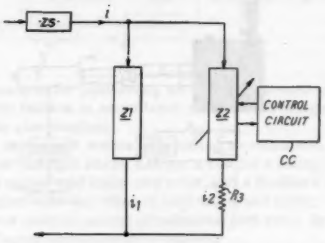
Claims priority, application United Kingdom, Sept. 15, 1972, 42981/72

Int. Cl.² H04B 1/64

U.S. Cl. 323—8 22 Claims

1. A circuit for modifying the dynamic range of a signal, comprising an input terminal and an output terminal, a first reactive impedance coupling said input terminal to said output terminal, an intermediate terminal, a second reactive impedance coupling said output terminal to said intermediate terminal, and a variable resistance network coupled between said intermediate terminal and a point of reference potential, said first and second impedances being of like nature such that the impedance and voltage ratios of the impedance between said input and output terminals and the voltage produced thereacross, respectively, to the impedance between said output and intermediate terminals and the voltage produced thereacross are frequency independent, the resistance of the variable resistance network being responsive to the level of a signal in the circuit to change the value of the resistance as the





said level increases, in such a sense as to exclude increased level signal components from the dynamic range modification.

3,934,191

CIRCUIT ARRANGEMENT FOR GENERATING A STABILIZED DIRECT VOLTAGE WITH SUPERPOSITION OF A CONTROL VOLTAGE

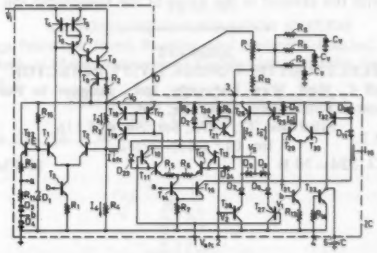
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,035

Claims priority, application Netherlands, Dec. 2, 1972, 7216406

Int. Cl.² H03J 3/18

U.S. Cl. 323—22 T 11 Claims



1. Circuit arrangement for generating a stabilized direct voltage upon which a control voltage is superposed for combined tuning and automatic frequency control of a receiver including a varactor diode, said circuit comprising a differential amplifier comprising first and second emitter-coupled transistor stages, a fixed reference voltage source coupled to the control electrode of the first transistor, a collector load for the second transistor, a passive resistive voltage divider having a first tapping coupled to the control electrode of the second transistor stage, a buffer amplifier coupled between the said collector load and the resistive voltage divider, and means for supplying a control current which produces the said control voltage to a second tapping on the resistive voltage divider for

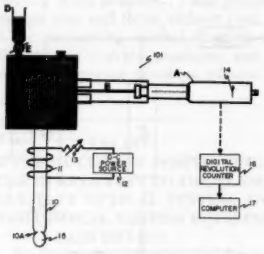
superposing the control voltage on the direct voltage across the resistive voltage divider.

3,934,192

METHOD OF DETECTION OF IONS IN SOLUTION THAT ARE SUSCEPTIBLE TO AN APPLIED FORCE FIELD AND APPARATUS THEREFOR

Christopher de Latour, Arlington, Va., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 25, 1974, Ser. No. 464,263
Int. Cl.² G01R 33/12
U.S. Cl. 324—34 R 32 Claims



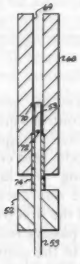
1. A method of determining the fractional content in a liquid solution of an ion susceptible to a gradient field of an applied force field, that comprises, forming at the end of a capillary tube a first drop of the solution containing the ion with no applied gradient field and noting at least one of the volume, V_o, and equivalently the weight, W_o, of the first drop that detaches from the capillary tube, forming at the end of the capillary tube a second drop of the solution containing the ion with a gradient field of an applied force field in the region occupied by the second drop and noting at least one of the volume, V_f, and equivalently the weight, W_f, of the second drop that detaches from the capillary tube in the presence of the gradient field, determining at least one of the volume change, ΔV, between the first and second drop and the actual weight change, ΔW, therebetween, and correlating at least one of the volume change, ΔV, and the actual weight change, ΔW, with the content in the drops of the susceptible ion.

3,934,193

ELECTROLYTIC CONDUCTIVITY DETECTOR

Randall C. Hall, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Filed Dec. 17, 1973, Ser. No. 425,116
Int. Cl.² G01N 27/42
U.S. Cl. 324—30 B 13 Claims



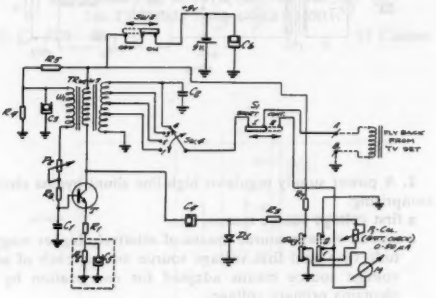
1. A unitized separator and measuring cell, comprising: an outer electrode having a bore therethrough, said bore receiving a mixture that is separated into liquid and gas phases during passage through said bore; an inner electrode having at least a portion within said bore of said outer electrode to form a passageway therebetween, said separated liquid phase passing into said passageway; and insulating means for electrically isolating said inner and outer electrodes from one another so that said electrodes are utilized to measure the conductivity of said separated liquid phase while between said electrodes.

3,934,194

SOLID STATE FLYBACK TRANSFORMER CHECKER

Kazimierz Paprocki, 2325 W. Haddon Ave., Chicago, Ill. 60622

Filed Mar. 26, 1974, Ser. No. 454,974
Int. Cl.² G01R 31/02
U.S. Cl. 324—51 8 Claims



1. An instrument for determining the relative impedance of a possibly defective transformer, of the type commonly used to develop the high voltage supply in a television receiver, compared with that of a normal transformer of that type, comprising:

an oscillator circuit for generating a bidirectional signal of a predetermined frequency and amplitude;

rectifying means coupled to said oscillator circuit for converting said bidirectional signal into a unidirectional signal;

display means responsive to said unidirectional signal for indicating the magnitude of said unidirectional signal;

calibration means, including a variable impedance coupled between said rectifying means and said display means for establishing a reference indication for said display means corresponding to the impedance of said normal transformer;

means for coupling the transformer to be tested in parallel with said oscillator circuit to supply the bidirectional signal to said transformer, whereby the loading on said oscillator circuit caused by the parallel impedance presented by said transformer systematically varies the magnitude of said unidirectional signal relative to said reference indication to thereby cause the display means to indicate whether or not the impedance of the transformer being tested corresponds to that of a normal transformer.

3,934,195

PORTABLE ELECTRIC CAPACITOR TESTER USING AN LED INDICATOR

Val Henry Shires, Biscayne Park, Fla., assignor to Surf Air Conditioning, Inc., Miami Beach, Fla.

Filed Feb. 4, 1974, Ser. No. 439,649
Int. Cl.² G01R 31/02, 11/52
U.S. Cl. 324—72.5 1 Claim

1. A portable electric tester for hand use comprising a casing having a cover portion and a demountable base portion,

a panel member secured within said cover portion including a printed circuit means on the underside thereof for providing circuit conductors for said tester, and three resistor means secured to said printed circuit means,

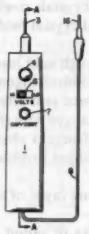
a battery means connected by a clip means and retained in said cover portion and connected in said circuit means,

a S.P.S.T. switch means secured on the said upper side of said printed circuit panel with the two terminals thereof connected in said circuit means and with the finger operator thereof extending through said cover portion of said casing,

a S.P.D.T. momentary contact switch means secured on the said upper said of said printed circuit panel with the three terminals thereof connected in said circuit means and with the push button operator thereof extending through said cover portion of said casing,

a LED indicator means secured to said printed circuit panel with the two terminals thereof connected in said circuit means,

a transparent jeweled bullseye secured through said cover portion of said casing adjacent to said LED indicator means,



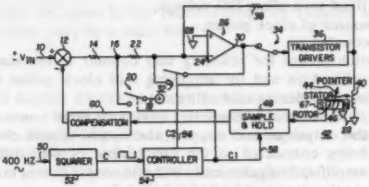
a tip probe means secured to said cover portion of said casing connected to said circuit means and a flexible test cord conductor means with one end of said test cord conductor means connected to said circuit means and the opposite end of said test cord conductor terminating in a clip probe means, both said probe means connected across a capacitor within a predetermined range of capacitances and the movement of said S.P.D.T. momentary contact switch means to the normally open position of said switch by said push button operator will energize said LED indicator and associated circuit means to produce a predetermined illuminance through said bullseye means with the said illuminance corresponding to the electrical condition of said capacitor under test and whereby when said push button operator of said S.P.D.T. momentary contact switch means is released to return to the normally closed position of said switch that said capacitor under test will discharge through said LED indicator and its associated circuit means to allow for subsequent testing of said capacitor and render said capacitor under test non-hazaradous to the user.

3,934,196

SERVOED INDICATING APPARATUS

Leon T. Gompert, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 15, 1973, Ser. No. 415,876
Int. Cl.[2] G01R 17/06, 1/16
U.S. Cl. 324—99 R **4 Claims**



1. Apparatus for positioning an indicator pointer in closed loop servo fashion in accordance with a control signal comprising, in combination:

prime movement means comprising a permanent magnet motor having a stator, a rotor, a control winding coupled with one of said stator and rotor, and a feedback winding coupled with the other of said stator and rotor;

indicator pointer means attached to said rotor for use in displaying apparatus input signals;

first means connected for, effectually, periodically initially applying a reference signal to said control winding and then applying a control error signal thereto for displacing the rotor in accordance with the error signal;

second means including sample and hold means for sampling a feedback signal from said feedback winding during the application of a reference signal to said control winding and providing as an output a position signal for a predetermined time;

apparatus input signal supplying means for supplying an input signal the value of which is to be displayed by said apparatus; and

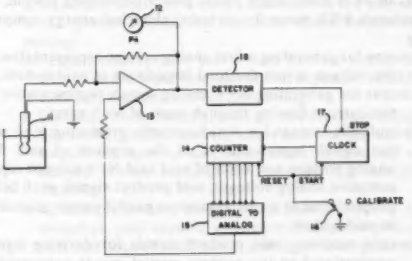
means connected to said first means, said second means and said apparatus input signal supplying means for supplying an error signal to said first means indicative of a comparison between the position signal and the input signal.

3,934,197

AUTOMATIC CALIBRATION SYSTEM

Aage Pettersen, North Reading, and Herbert Schulkind, Natic, both of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 3, 1973, Ser. No. 420,947
Int. Cl.[2] G01R 1/02
U.S. Cl. 324—130 **2 Claims**



1. An automatic calibration system for an electronic pH measuring system of the type which produces a measurement voltage in a predetermined range, which represents the pH of

a sample being analyzed and which includes a fixed zero offset DC voltage comprising:

a first difference amplifier, said measurement voltage being applied to one input to said difference amplifier,

indicating means operable over the range and connected to the output of said first difference amplifier for producing an output indication representing the pH of a sample being analyzed, said indication being corrected for said fixed zero offset DC voltage,

a source of clock pulses,

a counter,

switch means for resetting said counter at the start of a calibration and for supplying said clock pulses to said counter during said calibration,

a digital-to-analog converter having its input connected to the output of said counter, the output of said converter being connected to the other input of said difference amplifier to algebraically add said output to said measurement voltage, and

a detector connected to the output of said difference amplifier for stopping the supply of clock pulses to said counter when the algebraic sum of said measurement voltage and the output of said converter reaches a predetermined level.

3,934,198

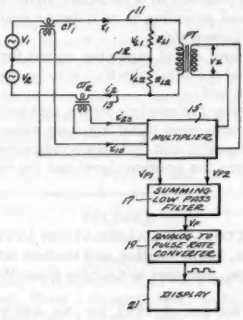
MULTI-WIRE ELECTRONIC KWH METER

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,299

Int. Cl.² G01R 11/32

U.S. Cl. 324—142 **14 Claims**



1. In an N wire, single phase power consuming system, an electronic kWh meter for metering electrical energy comprising

means for generating a first analog voltage representative of the voltage across the load impedance of said system,

means for generating N−1 analog signals representative of the current flowing through each of N−1 wires,

a multiplier means for simultaneously producing N−1 output signals representative of the product of said first analog voltage and each of said said N−1 current representative analog voltages, said product signals each being proportional to an instantaneous partial power consumed in said system,

means receiving said product signals for deriving signals proportional to the average partial power consumed in said system, and

means for summing said average partial power signals to derive the average power consumed in said N-wire single phase system.

3,934,199

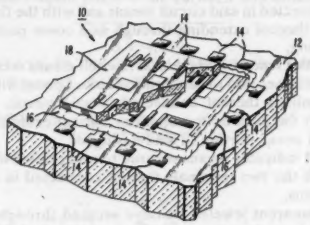
METHOD OF TESTING AN ELECTRICAL CIRCUIT

Donald Jones Channin, East Windsor, N.J., assignor to RCA Corporation, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,833

Int. Cl.² G01R 31/22

U.S. Cl. 324—158 R **4 Claims**



1. A method of testing an electrical circuit by observing birefringent changes in a layer of liquid crystals produced by electric fields in the circuit during the operation of the circuit, said method comprising the steps of:

applying said layer of liquid crystals over said circuit with substantially all of the liquid crystal molecules oriented in the same direction,

directing a beam of light through said layer with an optical system adapted to make said birefringent changes visible,

energizing said circuit to produce said birefringent changes,

observing said birefringent changes with said optical system, whereby the observed birefringent changes can be compared with birefringent changes produced by a normally operating circuit,

said circuit having a passivating layer of insulating material thereon, and

the step of applying said layer of liquid crystals over said circuit with substantially all of the liquid crystal molecules oriented in the same direction comprising:

applying a surfactant to said passivating layer,

drying said surfactant on said passivating layer, and

applying said layer of liquid crystals over the dried surfactant.

3,934,200

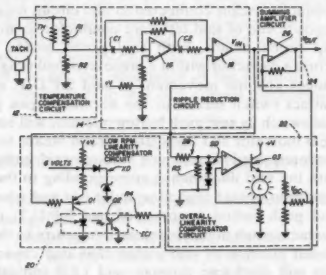
TACHOMETER CIRCUIT

Stanley C. Schoonover, Waynesboro, and Michael D. McIntosh, South Mountain, both of Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Filed Jan. 31, 1975, Ser. No. 545,993

Int. Cl.² G01P 3/46

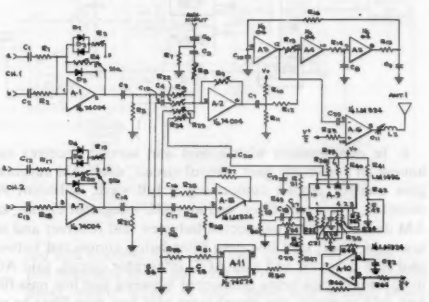
U.S. Cl. 324—163 **9 Claims**



1. A D.C. tachometer circuit comprising

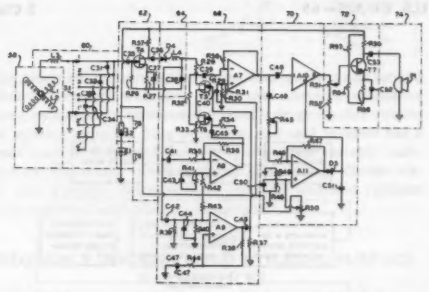
a non-linear D.C. tachometer which produces an output voltage having an A.C. ripple,
a first current path from said D.C. tachometer including
means for removing the D.C. component of the output voltage of the D.C. tachometer,
means for inverting and isolating the A.C. voltage ripple,
means for eliminating drift and the D.C. level of the inverted and isolated A.C. voltage ripple,
means for mixing the original output voltage of the D.C. tachometer including the A.C. ripple and the inverted and isolated A.C. voltage ripple to establish a non-linear ripple-free output voltage, and
means for linearizing said non-linear ripple-free output voltage.

3,934,201
LOW POWER CONSUMPTION STEREO TRANSMITTER AND RECEIVER SYSTEM
Richard L. Majefski, Rte. 1, Combs, Ark. 72721
Filed Mar. 22, 1974, Ser. No. 454,018
Int. Cl.² H04B 1/00
U.S. Cl. 325—36 **11 Claims**



1. A low power consumption, highly compact portable stereo radio transmission and receiving system for multi-channel transmission of musical signals and the like from a pair of stereo pickup stations to a nearby receiver-amplifier to provide a high fidelity stereo amplified audio output, comprising a compact portable stereo radio transmitter unit including a pair of audio processing channels each comprising an audio processing amplifier circuit having plural inputs to each amplifier circuit, said audio processing amplifier circuits each having means providing one mode of undistorted amplification, one mode of even harmonic generation and one mode of odd harmonic generation wherein even harmonics and odd harmonics respectively are added to the waveforms at the amplifier input, selector switch means coupled to each said audio processing amplifier circuits permitting selection between said three modes, a difference amplifier circuit coupled to the outputs of said audio processing channels for producing a difference output signal which is the difference between the output signals from said two channels, a first oscillator for generating a first frequency waveform, a balanced mixer circuit to which are applied said difference output signal and said first frequency waveform to produce a double-sideband suppressed carrier signal centered on the frequency of said first frequency waveform, a second oscillator including amplifier means for generating a carrier frequency signal, means for modulating said carrier frequency signal with a modulating signal combined from the outputs from said two channels and said double-sideband suppressed carrier signal including a summing amplifier receiving the output signals from both of said channels and the double-sideband suppressed carrier signal from said balanced mixer and providing a combined output which is applied to said second oscillator to modulate the carrier frequency signal, divider means receiving said first frequency waveform for producing a pilot signal having a frequency which is one-half the frequency of the first frequency waveform, means for applying said pilot signal to said summing amplifier to be combined with output signals from both of said channels and said double-sideband suppressed carrier signal including low pass filter means connected to the output of said divider means for removing the harmonic content of said output from said divider means, and antenna means coupled to the modulated carrier frequency signal for radiating the same to the receiver-amplifier coupled to the transmitter only by a radio link.

3,934,202
TOUR GUIDE SYSTEM INCLUDING MEANS FOR NOISE AND CROSSTALK SUPPRESSION
John V. Missale, New York City, N.Y., assignor to Telesonic Systems, Inc., Fairfield, N.J.
Filed Mar. 25, 1974, Ser. No. 454,519
Int. Cl.² H04B 5/00
U.S. Cl. 325—54 **10 Claims**



2. An improved, low power, multi-channel tour guide system comprising:
a transmitter including:
a recording means, at least one channel means and a closed loop transmitting antenna, each channel means comprising:
an electronic compressor connected to said recording means,
an oscillator means,
a modulator means connected to said oscillator means and to said compressor, and
a coupling means for connecting said channe. means to said closed loop transmitting antenna, and
at least one portable receiver including,
a receiving antenna,
a detector connected to said receiving antenna,
an expander having an input and an output terminal, said input terminal being connected to said detector, and an acoustical transducer means connected to the output of said expander means, said expander means further comprising:
an expander amplifier, and a feed forward circuit connected to the input terminal of said expander amplifier, said feed forward circuit comprising:
a first and second branch, each of said branches being in electronic parallel with the other and wherein said first branch includes an amplifier means therein and said second branch includes an inverting type amplifier therein,
a variable resistance means connected to both of said branches, said variable resistance means comprising a first and second field effect transistor with gates coupled together and with their cources and drains connected in series, said series combination of both having an expansion limiting resistance in shunt therewith, and wherein the gate of said first field effect transistor is connected to the output of said first branch and the

gate of said second field effect transistor is connected to the output of said second branch, and

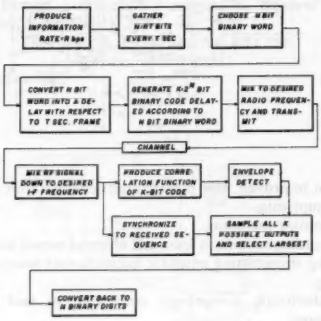
an input resistor between said expander amplifier input terminal and said variable resistance means and forming a variable resistance voltage divider network therewith, wherein low amplitude level signals are substantially shunted to ground by said variable resistance means and high amplitude level signals are passed to said expander amplifier whereby higher amplitude level signals are amplified with more gain than lower amplitude signals.

3,934,203

SPREAD SPECTRUM MODEM

Maurice Leon Schiff, Fort Wayne, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1974, Ser. No. 473,120
Int. Cl.² H04B *15/00*
U.S. Cl. 325—65 **1 Claim**


PRODUCE INFORMATION RATE-R bps
GATHER N-BIT BITS EVERY T SEC
CHOOSE N BIT BINARY WORD
CONVERT N BIT WORD INTO A DELAY WITH RESPECT TO T SEC. FRAME
GENERATE K-2^N BIT BINARY CODE DELAYED ACCORDING TO N BIT BINARY WORD
MIX TO DESIRED RADIO FREQUENCY AND TRANSMIT
CHANNEL
MIX RF SIGNAL DOWN TO DESIRED I-F FREQUENCY
PRODUCE CORRELATION FUNCTION OF K-BIT CODE
ENVELOPE DETECT
SYNCHRONIZE TO RECEIVED SEQUENCE
SAMPLE ALL K POSSIBLE OUTPUTS AND SELECT LARGEST
CONVERT BACK TO N BINARY DIGITS

1. A method for transmitting and receiving digital data in spread spectrum communication systems and comprising the steps of:

at a transmitting station, producing digital information at a rate R-bits/second;

forming said information into N-bit words each T-seconds, where $N=RT$;

dividing said T-seconds into $K=2^N$ units;

converting said N-bit words into a delay with respect to said T-seconds;

generating a K-bit binary code in response to each of said N-bit words and delayed according to the particular N-bit word;

mixing said code to a selectively predetermined radio frequency and transmitting the resulting signal;

at a receiving station, heterodyning said signal down to a selectively predetermined IF frequency;

producing the correlation function of the K-bit code after it is heterodyned;

envelope detecting said correlation function;

sampling all K possible outputs and selecting the largest of said outputs; and,

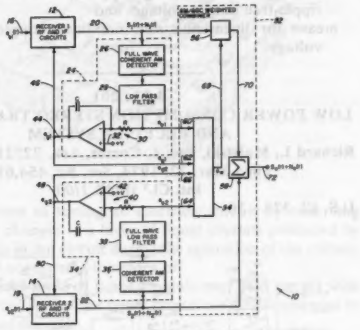
converting the selected output back to said N-bit word.

3,934,204

AM/AGC WEIGHTED DIVERSITY COMBINER/SELECTOR

Eugene R. Hill, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1974, Ser. No. 512,273
Int. Cl.² H04B *1/06*
U.S. Cl. 325—304 **37 Claims**


RECEIVER 1 RF AND IF CIRCUITS
FULL WAVE COHERENT AM DETECTOR
LOW PASS FILTER
AGC INTEGRATOR
FULL WAVE LOW PASS FILTER
COHERENT AM DETECTOR
RECEIVER 2 RF AND IF CIRCUITS

1. In combination with a first and second receiver each having an automatic gain control circuit, each said automatic gain control circuit comprising a full-wave, coherent AM detector, a low pass filter, and an AGC integrator circuit, said AM detector being connected between said receiver and said low pass filter, said low pass filter being connected between said AM detector and said AGC integrator circuit, said AGC integrator circuit being connected between said low pass filter and said receiver, the signal from said low pass filter to said AGC integrator circuit being an amplitude modulated (AM) voltage which is a filtered, full-wave, coherent, AM detected signal, the signal from said AGC integrator circuit to said receiver being an automatic gain control (AGC) voltage, said AGC integrator circuit also being supplied with a direct current AGC bias voltage from an AGC bias voltage source, said AGC bias voltages being identical for both automatic gain control circuits; a predetection, weighted diversity combiner for combining a first and second received signal from said first and second receiver so as to maximize the signal-to-noise ratio of the received signals comprising:

a. first circuit means receiving said AM and AGC voltages and said first received signal for weighting said first received signal with a combining ratio that is a function of said AM and AGC voltages, said first circuit means having an output; and

b. summing circuit means having an output for summing said weighted first received signal and said second received signal, said output being said combiner output.

3,934,205

FREQUENCY LOCK LOOP EMPLOYING A GATED FREQUENCY DIFFERENCE DETECTOR HAVING POSITIVE, ZERO AND NEGATIVE THRESHOLD DETECTORS

Warren D. Bogert, Fort Lee, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 27, 1975, Ser. No. 544,425
Int. Cl.² H04B *1/16*
U.S. Cl. 325—346 **6 Claims**

1. A gated frequency detector for a frequency lock loop circuit comprising:

a first source of a pulsed input signal;

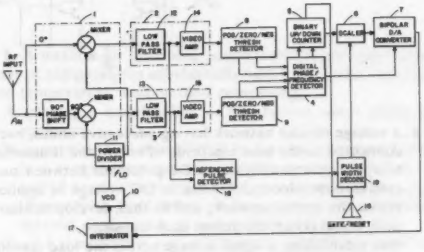
a second source of a variable frequency reference signal;

first means coupled to said first and second source for generating first and second phase quadrature frequency difference outputs;

means coupled to said first and second outputs for detecting the frequency difference between said first and second sources, said detecting means comprising:

a first threshold detector having first and second outputs, said first output being a logical pulse output which becomes high when said first phase quadrature frequency difference output is above a first predetermined threshold and remains high until said first difference output becomes zero, and said second output being a logical pulse output which becomes high when said first phase quadrature frequency difference output is below a second predetermined threshold and remains high until said second difference output becomes zero;

a second threshold detector having first and second outputs, said first output being a logical pulse output which becomes high when said second phase quadrature frequency difference output is above said first threshold and remains high until said second difference output becomes zero, and said second output is a logical pulse output which is high when said second phase quadrature frequency difference output is below said second threshold and remains high until said difference output becomes zero;



a digital phase frequency detector coupled to the output of said first and second threshold detectors for generating a first pulsed signal during the duration of said input pulse which corresponds to said frequency difference and a second signal which corresponds to the sense of said frequency difference;

counting means coupled to said first pulsed signal for counting the number of pulses;

second means coupled to said means for detecting for generating a DC voltage proportional to said frequency difference, said DC voltage applied to said second source for varying the output of said second source; and

a third source of a control gate pulse having an output coupled to said second means and synchronous with said first source for enabling and resetting the operation of said second means.

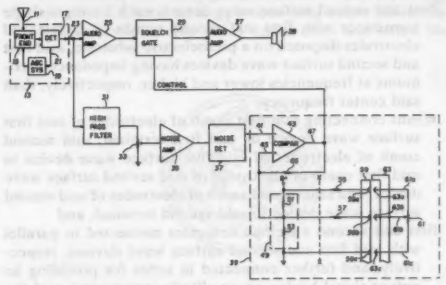
3,934,206

RECEIVER WITH ADJUSTABLE SQUELCH

C. Lloyd Holecek, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 26, 1974, Ser. No. 509,519
Int. Cl.² H04B 1/10
U.S. Cl. 325—478 **13 Claims**

1. A radio receiver having, optionally, preset or adjustable squelch means and comprising: demodulator means; means connected to said demodulator means for processing the intelligence of the demodulator output, and having gating means; and squelch circuit means connected to said demodulator means and said gating means for controlling said gating means, said squelch circuit means comprising means for establishing and comparing a squelch drive signal and a reference signal, and including at least one voltage dividing circuit means for controlling, prior to their comparison, the amplitude of at least one of said signals, said voltage dividing circuit comprising first and second series connected resistive elements; and squelch control adjustment means comprising variable resistance circuit means connectable to said voltage dividing circuit for providing first and second variable resistance electrical paths respectively around said first and second resistive elements whereby, when said variable resistance circuit means is not connected to said voltage divider circuit, said squelch means is fully operative, and said receiver has a preset squelch threshold level, and when said variable resistance circuit means is connected to said voltage divider circuit, said squelch means is fully operative and said receiver has an adjustable squelch threshold level.

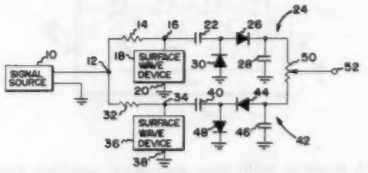


3,934,207

FREQUENCY DISCRIMINATOR UTILIZING SURFACE WAVE DEVICES

Martin Fischman, and G. Norman Williams, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 21, 1974, Ser. No. 516,175
Int. Cl.² H03D 3/16
U.S. Cl. 329—117 **9 Claims**



1. A frequency discriminator comprising:

a signal source having first and second terminals for providing a signal at said first terminal having frequencies that vary about a center frequency;

first and second surface wave devices each having a single transducer with first and second combs of interleaved electrodes disposed on a piezoelectric substrate, said first surface wave device having an impedance maximum at a frequency lower than said center frequency, and said second surface wave device having an impedance maximum at a frequency higher than said center frequency;

means connecting said first combs of electrodes of each of said first and second surface wave devices to said first terminal and said second combs of electrodes of each of said first and second surface wave devices to said second terminal;

first and second envelope detectors each having an input terminal connected to said first terminal and a common terminal connected to said second terminal for providing first and second output signals; and

means connected to said first and second envelope detectors for summing said first and second output signals to provide a signal having an amplitude representative of the frequency deviation of the signal provided by said signal source from said center frequency.

7. A frequency discriminator comprising:

a signal source having first and second terminals for providing a signal at said first terminal having frequencies that vary about a center frequency;

first and second surface wave devices each having a single transducer with first and second combs of interleaved electrodes disposed on a piezoelectric substrate, said first and second surface wave devices having impedance maximums at frequencies lower and higher, respectively, than said center frequency;

means connecting said first comb of electrodes of said first surface wave device of said first terminal, said second comb of electrodes of said first surface wave device to said first comb of electrodes of said second surface wave device, and said second comb of electrodes of said second surface wave device to said second terminal; and

first and second envelope detectors connected in parallel with said first and second surface wave devices, respectively, and further connected in series for providing an output signal having an amplitude representative of the frequency deviation of the signal provided by said signal source from said center frequency.

3,934,208

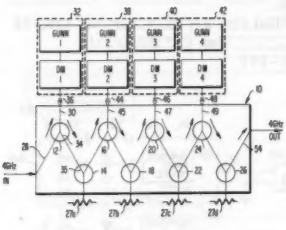
LOW NOISE MODULAR PARAMETRIC AMPLIFIER

William J. Getsinger, Bethesda; Paul Koskos, and Su Min Chou, both of Potomac, all of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed May 31, 1974, Ser. No. 475,343

Int. Cl.² H03F 7/04

U.S. Cl. 330—4.5 **3 Claims**



1. A modular multi-stage parametric amplifier assembly, including a multi-port strip line circulator assembly having a plurality of series-coupled Y-junction circulators and further comprising a plurality of parametric amplifier modules connected to selected ones of said circulators, whereby failure of an amplifier module does not interrupt operation of the parametric amplifier assembly, and a quick-disconnect coupler between each amplifier module and a corresponding one of said selected circulators.

3,934,209

HIGH VOLTAGE DC COUPLED AMPLIFIER

Alastair Valentine, West St. Paul, and Richard L. Dennison, Burnsville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 23, 1974, Ser. No. 463,251

Int. Cl.² H03F 3/42

U.S. Cl. 330—18 **15 Claims**

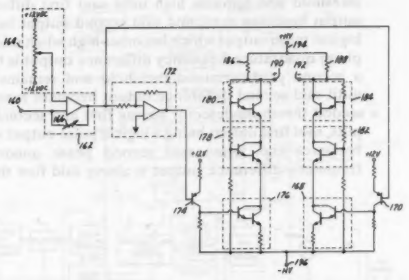
1. A DC voltage amplifier comprising:

a. means for receiving parallel binary coded input signal voltages,

b. means for converting said binary coded input signal voltages to a corresponding signal current,

c. an active network including a succession of serially connected transistors having substantially the same electrical characteristics for receiving said signal current in series through each of said transistors,

d. a load resistor for receiving such current as flows through said active network, and



e. a voltage divider network having successive nodes, each connected to the base electrode of one of the transistors to apply substantially equal Dc potentials between successive base electrodes when a DC voltage is applied across the active network, and to thus develop substantially equal potentials across each transistor,

thus establishing a signal voltage across the load resistor which increases in response to an increase in the input signal voltage, whereby the breakdown voltage rating of the amplifier is equal to the sum of the breakdown voltages of the transistors in the active network.

3,934,210

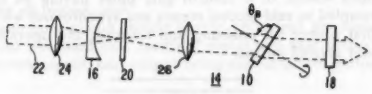
TUNING APPARATUS FOR AN OPTICAL OSCILLATOR

J. Michael Yarborough, Tuscon, Ariz., and James L. Hobart, Los Altos Hills, Calif., assignors to Coherent Radiation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 365,317, May 30, 1973, Pat. No. 3,868,592. This application May 30, 1974, Ser. No. 474,305. The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.

Int. Cl.² H01S 3/10

U.S. Cl. 331—94.5 C **6 Claims**



1. A method of tuning or narrowing the output of an optical oscillator comprising:

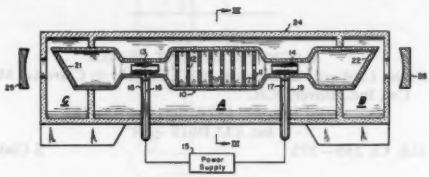
placing a birefringent plate having an ordinary and an extraordinary index of refraction within the optical cavity of the optical oscillator at Brewster's angle with respect to light reflected within the optical cavity thereof; and

rotating said plate to effectively change the extraordinary index of refraction of said birefringent plate while the ordinary index of refraction thereof remains the same to obtain the desired output wavelength, while maintaining said birefringent plate at the same angle with respect to the reflected light.

3,934,211
METAL HALIDE VAPOR LASER

Eugene W. Sucov, and Leland A. C. Weaver, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 339,697, March 9, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 505,400
Int. Cl.² H01S 3/22
U.S. Cl. 331—94.5 G **14 Claims**



1. A method for obtaining pulsed metal vapor laser transitions at temperatures substantially below the metal vaporization temperature, said method comprising:

A. placing a metal halide of the desired metal within an enclosure;

B. vaporizing said metal halide by heating said metal halide to a temperature not substantially in excess of that required to provide a high molecular vapor pressure, said temperature level being such as to prevent substantial thermal dissociation of said metal halide;

C. at a temperature not substantially greater than said vaporizing temperature

i. collisionally dissociating the metal halide vapor with energized electrons to provide ground state metal atoms of sufficient number density to create resonance radiation trapping, and substantially simultaneously therewith

ii. creating a population inversion between a desired upper laser level and lower laser level of said metal by exciting ground state metal atoms with energized electrons and maintaining a sufficient number of metal atoms in the ground state to preserve said resonance radiation trapping,

said energized electrons of steps (i) and (ii) being produced by ionization and having a mean electron energy of at least that required to excite the upper laser level of said metal atom;

D. permitting said excited metal atoms to emit laser radiation by stimulated emission to low laser level and resonating said emission; and

E. permitting said metal atom to relax from said lower laser level to said ground state and repeating steps C, D and E.

3,934,212
GAS LASER WITH AN AMINE SEED GAS

Ali Javan, Cambridge, and Jeffrey Steven Levine, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 335,820, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 301,894, Oct. 30, 1972, Pat. No. 3,826,997. This application Oct. 24, 1974, Ser. No. 517,771
Int. Cl.² H01S 3/22, 3/09
U.S. Cl. 331—94.5 PE **35 Claims**

1. A laser comprising:

a volume of gas having a lasing constituent and a seed gas distributed throughout said lasing constituent,

said seed gas comprising an amine having the structure

where R_1, R_2, and R_3 represent alkyl groups and in which R_2 and R_3 may together form a cycloalkyl group, said seed gas having an ionization potential below that of said lasing constituent,

a light source arranged to emit light having ionizing photons for ionizing said seed gas, the effective photon energy spectrum of said ionizing photons lying below the ionization potential of said lasing constitutent and below the

level of photon absorption bands of said gas, said spectrum being selected to provide an average penetration depth of said ionizing photons into said gas of at least 1 cm., and

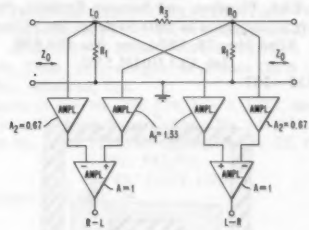
means comprising an electric field source for applying to said gas a voltage to produce a plasma energized to create a population inversion in said lasing constituent, and,

means for stimulating the emission of coherent radiation therein.

3,934,213
BROAD BAND DIRECTIONAL COUPLING CIRCUIT

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1974, Ser. No. 484,190
Int. Cl.² H03H 7/48
U.S. Cl. 333—10 **21 Claims**



1. A broad band directional coupling circuit for insertion in a single-signal path or transmission line in which signals are propagated simultaneously in opposite directions, comprising:

a. an attenuator network employing linear, nonreactive impedance elements for insertion in said signal path or transmission line, said impedance elements forming at least first and second nodes;

b. first signal combining means coupled to said first and second nodes for combining in a first predetermined ratio the signals at said first and second nodes to provide an output signal proportional to a signal propagating in a first direction only in said single-signal path or transmission line while providing substantially no output signal for a signal propagating in the opposite direction; and

c. a second signal combining means coupled to said first and second nodes for combining in a second predetermined ratio the signals at said nodes to provide an output signal

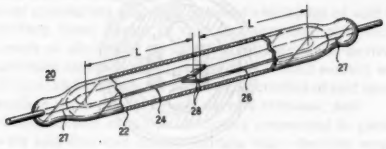
proportional to a second signal propagating in a second direction opposite to said first direction only in said single-signal path or transmission line while providing substantially no output signal for a signal propagating in said first direction.

3,934,214

SEALED CONTACT HAVING TAPERED REED TIPS

Wendel Edward Archer, Gahanna, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1975, Ser. No. 563,723
Int. Cl.² H01H 51/28
U.S. Cl. 335—154 3 Claims



1. A magnetic reed contact comprising,

a capsule,

a pair of magnetic reeds, each reed having a fixed end sealed in the capsule and a flat movable end portion with side edges substantially parallel to one another for a predetermined length and tapered toward one another from the end of the predetermined length to the movable end,

the reeds are positioned with respect to one another so that the movable ends overlap one another by an overlap length and define an overlap area, and

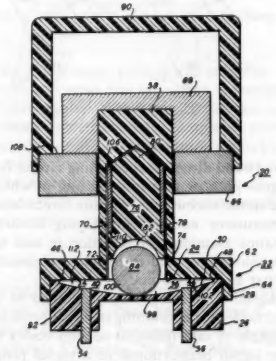
the overlap area is less sensitive to variation in overlap length than the overlap area of a conventional reed contact having reeds cut substantially normal to the parallel side edges.

3,934,215

SWITCH MECHANISMS

Donald S. Rich, Flanders, and Norman Rudnick, Piscataway, both of N.J., assignors to Inflo Systems, Inc., Chester, N.J.

Filed May 28, 1974, Ser. No. 474,038
Int. Cl.² H01H 5/02
U.S. Cl. 335—207 6 Claims



1. Push-button operating means for operating magnetic responsive switch mechanisms of the type which is manually operated, said push-button operating means comprising:

a. means for housing the magnetic switch mechanism;

b. a magnet surrounding at least a part of said housing means;

c. keeper means for holding said magnet in a quiescent position;

d. push-button means for moving, in response to the manual operation, said magnet from said keeper with a predetermined initial force, said initial force being greater than that force necessary to continued movement of said magnet with respect to said switch housing, thereby stimulating tactile breakthrough and operating the switch mechanism; and

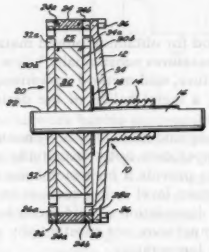
e. stop means for limiting the travel of said magnet.

3,934,216

MAGNETIC DETENT DEVICE

Frank L. Ward, Kensington, N.H., assignor to Clarostat Mfg. Co., Inc., Dover, N.H.

Filed Dec. 11, 1974, Ser. No. 531,757
Int. Cl.² H01F 7/14
U.S. Cl. 335—272 3 Claims



1. A multi-position rotary detent device including, in combination, a first rotary member, a first magnet of said first rotary member having first and second magnetic surfaces respectively oriented magnetic north and magnetic south, first and second pole members of said first rotary member respectively adjacent said first and second magnetic surfaces, and first and second pole members being in fixed relation with said first magnet and formed of a magnetic material, radially projecting first and second pole pieces of said first and second respective pole members, a second rotary member rotatably supported with respect to said first rotary member, a second magnet of said second rotary member having third and fourth magnetic surfaces respectively oriented magnetic south and magnetic north, third and fourth pole members of said second rotary member respectively adjacent said third and fourth magnetic surfaces, said third and fourth pole members being in fixed relation with said second magnet and formed of a magnetic material, radially projecting third and fourth pole pieces of said third and fourth respective pole members, said first and third pole pieces projecting toward each other, said second and fourth pole pieces projecting toward each other, and means for relatively rotating said first and second rotary members whereby the relative angular position of said first rotary member with respect to said second rotary member determines the magnetic flux paths between selected first and third pole pieces and selected second and fourth pole pieces.

3,934,217

THERMOSTAT CONTROL DEVICE

Ivo Brcic, Willowdale, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

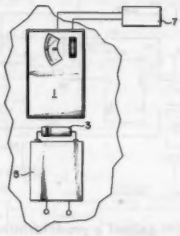
Filed Aug. 9, 1974, Ser. No. 496,254
Int. Cl.² H01H 61/02
U.S. Cl. 337—107 2 Claims

1. A thermostat offsetting device for controlling the opera-

tion of a thermostat having a selected setting thereon, said thermostat offsetting device comprising

an electric heating device in close proximity with a thermostat;

electrical energizing means for energizing the heating device, said energizing means including switch means for selectively activating the energizing of the heating device and deactivating the energizing of the heating device; and



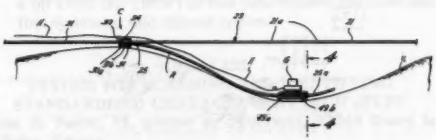
timer means coupled to the switch means for closing the switch means thereby energizing the heating device and raising the temperature in the area of the thermostat above room temperature by ΔT determined by the amount of heat generated by the heating device and the distance between the heating device and the thermostat and opening the switch means after a preselected period of time thereby deenergizing the heating device and lowering the temperature in the area of the thermostat to the room temperature whereby the thermostat controls the room temperature in accordance with the setting thereon.

3,934,218

APPARATUS AND METHOD FOR SEISMIC EXPLORATION

John J. Babb, Jackson, Miss., assignor to Seiscom Delta Inc., Houston, Tex.

Filed Aug. 17, 1971, Ser. No. 172,403
Int. Cl.² G01S 9/66
U.S. Cl. 340—3 T **3 Claims**



1. An apparatus for seismic exploration operations using seismic signals comprising:

a. geophone means for sensing the seismic signals during the exploration operations;

b. towing means for moving and placement of said geophone means in position for the exploration operations, said towing means comprising a towing sheet member having an aperture formed therein for permitting movement of said geophone means through said towing sheet member during movement and placement of said geophone means on surfaces; and

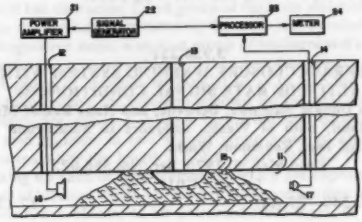
c. resilient means for isolating said geophone means from vibrations and the like in said towing means wherein more accurate exploration results are obtained, said resilient means comprising resilient strip means for mounting said geophone means with said towing sheet member preventing contact between said geophone means and said towing member to permit said resilient strip means to absorb the vibrations and the like induced in said towing sheet member during seismic exploration, wherein said geophone means is acoustically decoupled and isolated from the vibrations in said towing sheet member.

3,934,219

ACOUSTIC METHOD AND APPARATUS FOR DETERMINING EFFECTIVENESS OF MINE PASSAGE SEAL

David A. Monaghan, Newton Center, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 11, 1974, Ser. No. 504,468
Int. Cl.² H04B 11/00; E21C 37/00, 41/00, 45/00
U.S. Cl. 340—15 **15 Claims**



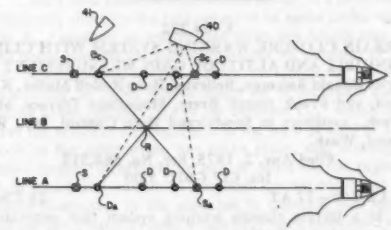
1. A method of determining the effectiveness of a seal tending to block an underground passage comprising transmitting acoustic energy in the passage toward the seal so that at least a portion of the energy impinges on the seal, a first component of the transmitted energy having a tendency to be transmitted through the seal, a second component of the transmitted energy having a tendency to be reflected from the seal, detecting one of said components of the transmitted acoustic energy, and in response to the amplitude of the detected acoustic energy determining the effectiveness of the seal.

3,934,220

METHOD OF SEISMIC EXPLORATION FOR PENETRATING DIFFRACTION BARRIERS AND/OR SURVEYING BENEATH OBSTACLES

JLee Davis, Ector, Tex., assignor to Avance Oil & Gas Company, Inc., Midland, Tex.

Continuation of Ser. No. 376,219, July 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 145,811, May 21, 1971, Pat. No. 3,746,122. This application Jan. 22, 1975, Ser. No. 542,941
Int. Cl.² G01V 1/20
U.S. Cl. 340—15.5 MC **2 Claims**



1. A method for penetrating a seismic diffraction barrier created by objects in, in the neighborhood of, or above a geologic region of interest desired to be seismically explored comprising:

generating multiple pieces of data from a given reflecting point by means of disturbances created at source points and detectors located at detecting points such that at least some pairs, each pair comprising one source point and one detecting point, are aligned on azimuths which intersect at a vertical line passing through said reflecting point;

recording said multiple pieces of data, said data recordings containing diffraction signals masking a signal from said reflecting point in the geologic region of interest;

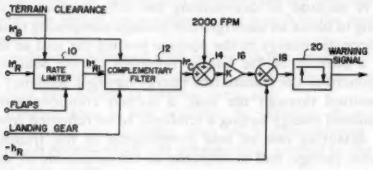
and combining data recordings containing data generated along a multiplicity of azimuths having a common intersection, whereby said diffraction signals in large part additively cancel one another and the signals from said reflecting point additively reinforce one another, to produce a composite recording containing a discernable signal representing said reflecting point.

3,934,221

TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING

Charles Donald Bateman, Bellevue, and Hans Rudolf Muller, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Mar. 6, 1975, Ser. No. 556,022
Int. Cl.² G01C *5/00*
U.S. Cl. 340—27 AT **17 Claims**



1. In a terrain warning system for aircraft utilizing the comparison of an altitude above ground signal received from a radar altimeter with an altitude rate signal derived from the altitude above ground signal to generate a warning signal indicating excessive terrain closure rates, wherein the improvement comprises:

means for conditioning the altitude rate signal indicating a decrease in altitude; and means operatively connected to said conditioning means for limiting the altitude rate signal indicating an increase in altitude, in relation to the altitude rate signal indicating a decrease in altitude in order to increase the time response of the terrain warning system by decreasing the effects of the altitude rate signal indicating an increase in altitude.

3,934,222

TERRAIN CLOSURE WARNING SYSTEM WITH CLIMB INHIBIT AND ALTITUDE GAIN MEASUREMENT

Charles Donald Bateman, Bellevue; Hans Rudolf Muller, Kirkland, and Frank Joseph Brem, Mountlake Terrace, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

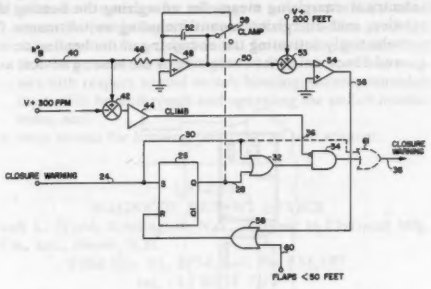
Filed Apr. 2, 1975, Ser. No. 564,512
Int. Cl.² G01C *5/00*
U.S. Cl. 340—27 AT **21 Claims**

1. In a terrain closure warning system that generates a warning signal indicating an excessive rate to the terrain, wherein the improvement comprises:

means for indicating that the aircraft is climbing at a predetermined rate;

means for measuring the aircraft's gain in altitude;

means, responsive to said indicating means and said measuring means, for reactivating the warning signal when the aircraft has discontinued climbing at said predetermined



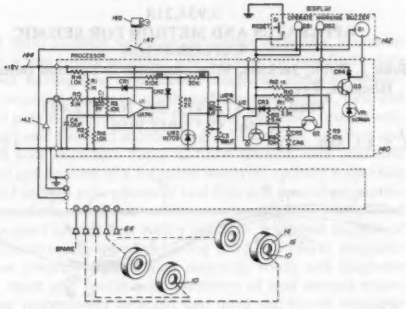
rate and has not gained a predetermined amount of altitude.

3,934,223

TIRE PRESSURE WARNING SYSTEM

William A. Barabino, North Reading, Mass., assignor to Safety Research & Engineering Corporation, North Reading, Mass.

Filed Dec. 4, 1973, Ser. No. 421,538
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **7 Claims**



1. A system for monitoring the pressure of a pneumatic tire for a vehicle having an ignition system, comprising

a. a pressure responsive acoustical signal generating device operatively connected to said tire, said device adapted to generate an acoustical signal whenever the pressure in said tire reaches a predetermined level,

b. acoustical signal sensing means mounted on said vehicle remote from said device,

c. alarm means operatively connected to said sensing means for providing an alarm output in response to the detection of a signal by said sensing means,

d. memory means operatively connected to said sensing means and said alarm means for passively storing a signal from said sensing means, and,

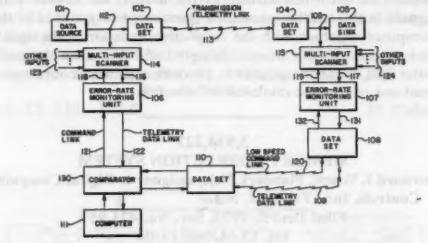
e. switch means connected to said memory means and to said alarm means and responsive to actuation of said ignition system for transferring signals from said memory means to said alarm means.

3,934,224

APPARATUS FOR CONTINUOUS ASSESSMENT OF DATA TRANSMISSION ACCURACY IN A COMMUNICATION SYSTEM

Ernest N. Dulaney, Clearwater, and Richard F. Elmhurst, Largo, both of Fla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Oct. 29, 1974, Ser. No. 518,538
Int. Cl.² G06F *11/00*; G08C *25/02*
U.S. Cl. 340—146.1 BA **15 Claims**



1. An apparatus for in-service monitoring of the accuracy of electronic data transmitted over a first communication channel or telemetry link comprising:

a. first means, in a first system, for monitoring for accuracy a first unit of said data transmitted over said first communication channel;

b. second means, in a second system, for monitoring for accuracy a second unit of said data received over said communication channel;

c. third means, in said second system coupled to said second means, for transmitting substantially all of said second monitored unit of said data, which is a full version of the information in said second monitored unit of data, to said first system over a second communication channel;

d. fourth means, in said first system coupled to said first means, for comparing substantially all of said first unit of monitored data, which is a full version of the information in said first unit of monitored data, with substantially all of said second unit of monitored data; and

e. fifth means, coupled to said fourth means, for calculating a bit error rate (BER) of said data transmitted from said first system to said second system.

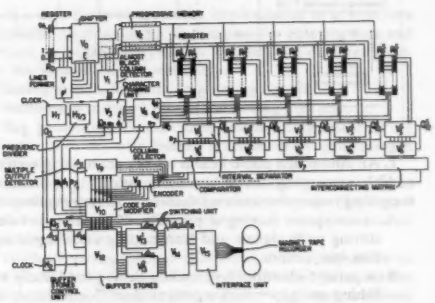
3,934,225

SYSTEM FOR SCANNING AND IDENTIFYING STANDARDISED CHARACTERS AT HIGH SPEED

Rene de Possel, 55, avenue du Panorama, 92340 Bourg la Reine, France

Filed Jan. 15, 1974, Ser. No. 433,438
Claims priority, application France, Jan. 19, 1973, 73.01923
Int. Cl.² G06K *9/12*
U.S. Cl. 340—146.3 J **10 Claims**

1. A system for scanning and identifying characters in a document carrying a text made up of equidistant parallel lines of equal length placed one below another, some lines possibly being blank, the said system including means for scanning the text in successive transverse sweeps during each of which a transverse band covering a small number of lines of writing is scanned, the document being movable relative to the fixed position of the band so that, between one transverse sweep and the next, each line of writing comes into substantially the same position as the line before, each band being itself scanned at a frequency T in J equidistant columns, each of said columns being divided into a number N of small areas which form a line, the said scanning means supplying N electrical signals formed by a 0 or a 1 which correspond respectively to the whites and blacks or vice versa in the text, the system being characterised by the combination of means for extracting from each of the successive bands the signals corresponding to one line of writing in such a way that each line is extracted once and once only, means for extracting from each of the columns J in the band an interval containing a fixed number N′ of bits which forms a part-column G such that each column G extends over the whole height of the selected line of writing, a progressive store comprising N′ shift registers in which each bit moves up one position after each time T, means for feeding the part column G into said store, means to discover, for each of the characters encountered, which is the first and last of the columns G associated with this character before the said columns are fed into the progressive store, means for extracting for each character in the selected line of writing, a small number of columns from the columns G which cover the character, this number being calculated as a function of their total number and being intended for the identification of the character; a first group of registers and means to transfer the respective columns G_1, G_2 to them in parallel from said progressive store, a second group of registers and means to transfer the contents of said first group of registers to said second group of registers in parallel so as to free the latter which then receive the columns selected for the next character, which are selected in their turn from said progressive store, said registers in said second group being so arranged that means allow the length A_j^i of the part intervals I^i1, I^i2 . . . making up each of the columns G^i, which are expressed as number of bits and which are formed from consecutive whites or consecutive blacks, to be extracted from them, so as to



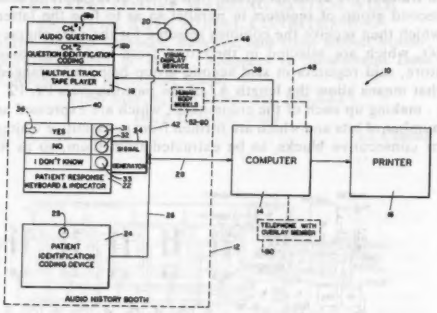
correct for possible spots or missing areas, means for comparing these lengths with predetermined fixed numbers $C^i{}_{j1}$ $C^i{}_{j2}$ . . . , the said comparison means being arranged to allow one or more inequality tests which compare the lengths A_j^i with these fixed numbers $C^i{}_{jm}$ to be associated with each of the characters $\geq|$ in the alphabet employed, so that, if the inequality conditions of one of these tests are satisfied in the case of an unknown character the latter is thus identified with Λ , the said means enabling a length $\geq|_j{}^i$ to be compared with $C_{j,1}{}^i$, $C_{j,2}{}^i$ . . . , each time such a length is ascertained, in a time which is sufficiently short for the said means to be again usable when length $A_{j+1}{}^i$ appears no matter how short this length may be, it also being possible for the comparisons for columns G^1, G^2 . . . to be carried out simultaneously, an identifying member incorporating an input device made up of locations corresponding to the indices i, j, k of the constant $C_{j,k}{}^i$, which each receive the result of a comparison in the form of an 0 or 1 bit as soon as the comparison has taken place, said identifying member further incorporating one or more output registers each of which is made up of locations corresponding to the different characters in the alphabet in question and means which use the inequality tests which have been associated with each character so that the character which is identified is indicated by a 0 (or a 1) at the location which corresponds to it and by a 1 (or a 0) at all the other locations in each of the output registers, this character being considered a valid one where the identifying member has only one output register, or, where the identifying member has a plurality of output regis-

ters, the inequalities employed for each of the characters calling into play pairs of indices which are generally different from one register to another, identification being considered valid if all the output registers of said identifying member indicate the same character or if this character predominates and means for supplying the characters so identified in the form of coded signals.

3,934,226
AUTOMATED AUDIO HEALTH HISTORY ACQUISITION SYSTEM

Stanford C. Stone, Deerfield, and Irwin H. Sommerfeld, Mount Prospect, both of Ill., assignors to International Health Systems, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 199,711, Nov. 17, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,660
Int. Cl.² G06F *3/16*; G09B *7/06*
U.S. Cl. 340—172.5 **12 Claims**



1. An automated audio health history acquisition system for audibly presenting health history questions to a patient and recording responsive answers thereto, said system comprising:

A. a computer having a plurality of register circuits for storing code signals and transmitting code signal operation instructions,

B. a patient identification coding device for initally establishing and generating a patient identification code signal and transmitting the same to the computer for storage therein, the patient identification coding device including an actuating device for activating the computer,

C. a multi-channel recorder with audio output operable by signals generated by said computer after the patient identification code signal has been initiated, said recorder including

i. a first memory channel having said questions recorded thereon in a predetermined sequence to be audibly presented one question at a time to the patient,

ii. a simultaneously operable second memory channel having code signals recorded thereon to identify each question recorded on said first channel and transmit to the computer said question code signals,

D. at least one human figure model for visual display to the patient, the model having a front three-dimensional surface and a rear planar surface, the rear surface being formed with a matrix of electrical circuitry having junction points spread throughout the surface thereof, a plurality of energy transmitting conduits originating from selected ones of the junction points and terminating with light emitting elements at selected points proximate the front surface of the model, the matrix being controllably connected with the computer,

E. a patient response device for receiving the audio output of the first channel and including

i. a keyboard operable by the patient in response to the questions to selectively indicate answers to said questions by one of a series of predetermined answers,

ii. an answer code signal generator for generating code signals according to the patient indicated answer and transmitting the same to the computer for correlated storage with the respective question code signals, and

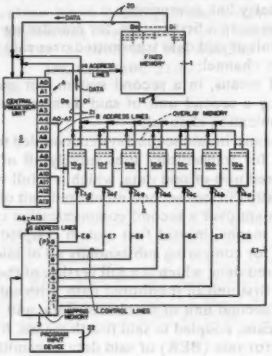
F. a read-out printer responsive to signals generated by the computer to produce a printed record of the signals stored in the computer,

whereby activation of the actuating device will cause the computer to start the recorder and audibly present questions seriatum to the patient and cause the light emitting elements to illuminate to display a desired simulated pain or discomfort pattern on the front surface of the model, the answer code signals to the audibly presented questions being stored in the computer together with the respective question code signals and patient identification code signal and thereafter the computer will cause the printer to produce a printed coordinated read-out of the accumulated information.

3,934,227
MEMORY CORRECTION SYSTEM

Bernard I. Worst, Flanders, N.J., assignor to Digital Computer Controls, Inc., Fairfield, N.J.

Filed Dec. 5, 1973, Ser. No. 421,959
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **3 Claims**



1. A memory system for use with a central processor unit having an address register comprising:

a. a fixed memory having a plurality of fixed memory registers addressable by the address register of the central processor unit, and a control input for enabling or disabling the fixed memory in accordance with the state of the control input;

b. an overlay memory having a plurality of sections of overlay memory registers, corresponding registers in each section being addressable simultaneously by a first portion of the address in the address register of the central processor unit;

c. each section of the overlay memory having a control input for enabling or disabling such section in accordance with the state of its control input; and

d. a mapping memory having a plurality of mapping memory registers addressed by a second portion of the address of the address register of the central processor unit;

e. a first cell of each register of the mapping memory having a predetermined content and being connected to the control input of the fixed memory for establishing the state of such control input; and

f. the remaining cells of each register having predetermined contents and being respectively connected to the control inputs of the sections of the overlay memory for establish-

ing the state of each of such sections whereby the contents of the first cell of the addressed memory register determines whether the fixed memory is enabled or disabled, and the contents of the remaining cells of the addressed memory register disables all of the sections when the fixed memory is enabled, and enables one and only one of the sections when the fixed memory is disabled.

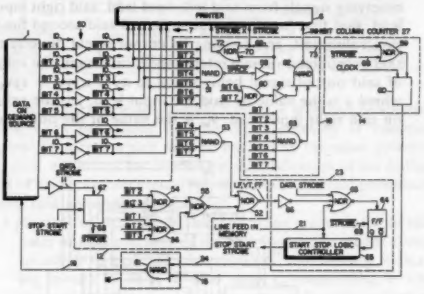
3,934,228
PARALLEL INTERFACE WITH HIGH SPEED PRINTER

Paul J. Moran, Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Continuation of Ser. No. 314,584, Dec. 13, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,083

Int. Cl.² G06F *3/12*

U.S. Cl. 340—172.5 **19 Claims**



1. Apparatus for controlling the processing of output signals presented sequentially from a source and related to printing wherein said output signals comprise coded signal representing printable characters to be printed and SPACE commands to control the spacing of characters to be printed, said apparatus comprising,

a memory and a column counter associated with said memory,

means for sensing said presented signals to identify such signals as representing printable characters or SPACE commands, means for storing sensed signals identified as representing printable characters but not sensed signals identified as representing SPACE commands in said memory,

means for changing the count state of said column counter by a given count in response to each sensed signal identified as representing a printable character or SPACE command to produce count indicating signals,

means coupled to said column counter for storing in said memory a count indicating signal corresponding to each change in count of said column counter associated with a sensed signal identified as representing a printable character but not a sensed signal identified as representing a SPACE command,

means coupled to said source and responsive to a sensed signal identified as representing a printable character but not a SPACE command for delaying, by a first time interval, the presentation from said source of a subsequent occurring output signal,

and means coupled to said source and responsive to a sensed signal identified as representing a SPACE command for storing in said memory a sensed signal identified as representing a printable character without said first time interval delay.

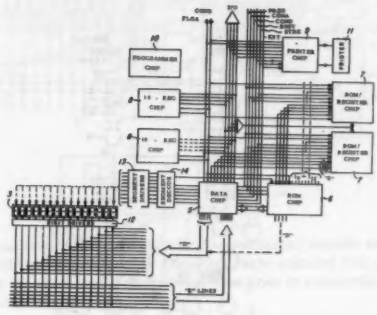
3,934,229
EXTERNAL REGISTER MEMORY CHIP IN A CALCULATOR SYSTEM

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1973, Ser. No. 423,355

Int. Cl.² G06F *15/00*

U.S. Cl. 340—172.5 **10 Claims**



1. In a data processing system, implemented in at least one semiconductor chip having input means for entering data and functions, and control means for handling the data and functions, the improvement comprising:

a. timing means, for providing timing signals;

b. instruction memory means for storing instructions;

c. flag generating means connected and responsive to the instruction memory means for selectively generating a flag signal;

d. combining means connected to the timing means and to the flag generating means for combining the flag signal and any one of the timing signals into a unique store or read addressing signal; and

e. auxiliary storage means connected to and responsive to the combining means for storing in the storage means the input data and functions in address locations determined by the unique store addressing signals and for reading out of the storage means the data and functions from address locations determined by the unique read addressing signals.

3,934,230
AUTOMATIC SELECTOR FOR PERIPHERAL EQUIPMENT

Yves Salle, Boulogne-sur-Seine, and Marcel Pincemin, Ris Orangis, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Dec. 28, 1973, Ser. No. 429,201

Claims priority, application France, Dec. 28, 1972, 72.46631

Int. Cl.² G06F *3/00;* **H04Q** *3/00*

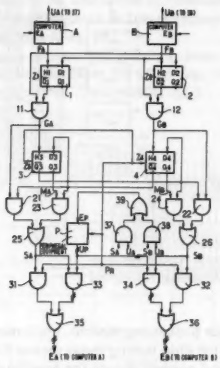
U.S. Cl. 340—172.5 **8 Claims**

1. An automatic selector associated with a peripheral equipment capable of exchanging data with one or the other of first and second computers for connecting the peripheral equipment to the computer which is the first to request connection to the peripheral equipment and for maintaining that connection until the selected computer is finished exchanging data, comprising

a first selection stage including means responsive to address outputs representing request for connection to the peripheral equipment from said first and second computers for generating a first signal when said first computer request is the first received and for generating a second

signal when said second computer request is the first received,

a second selection stage connected to receive said first and second signals and including means responsive to a busy free output from said peripheral equipment representing the busy/free condition thereof and said first and second signals for generating a first selection signal when a first signal is received from said first selection stage and said



peripheral equipment is free and for generating a second selection signal when a second signal is received from said first selection stage and said peripheral equipment is free, and

coupler means for enabling the application of data from said first computer to said peripheral equipment in response to said first selection signal and for enabling the application of data from said second computer to said peripheral equipment in response to said second selection signal.

3,934,231

ADAPTIVE BOOLEAN LOGIC ELEMENT

William Ward Armstrong, Montreal, Canada, assignor to Dendronic Decisions Limited, Montreal, Canada

Filed Feb. 28, 1974, Ser. No. 446,968

Int. Cl.² G06F *15/18*

U.S. Cl. 340—172.5 **10 Claims**

1. A digital logic circuit, hereinafter referred to as an element, which is a basic building block of learning machines formed by interconnection of a plurality of said elements into a network, which network under the control of an agent hereinafter referred to as a control unit, during a training period can learn a boolean function of n variables, the latter applied by said control unit through a scheme of multiple connections and connections with inversion to certain inputs of said network, the action of each said element in forming the relationship between the said n variables and the network output being to process information as a two-input, one-output combinational circuit the logical operation of which depends on the internal state of said element, which internal state may be altered by the control unit's applying a training procedure to said network; and which element comprises:

input-and-output means comprising a first input lead, hereinafter referred to as the left input lead, a second input lead, hereinafter referred to as the right input lead, and an output lead;

control signal input means for receiving control signals, comprising a clock lead and a desired network output lead;

heuristic responsibility input-and-output means comprising a heuristic responsibility input lead, a left heuristic responsibility ouput lead, and a right heuristic responsibility output lead;

output computation means;

a first function value unit means;

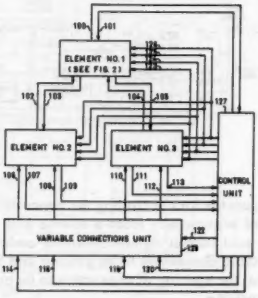
a second function value unit means;

a first heuristic responsibility unit means, hereinafter also referred to as the left heuristic responsibility unit means;

a second heuristic responsibility unit means, hereinafter also referred to as the right heuristic responsibility unit means; and

interconnection means for connecting the aforementioned means as hereinafter required comprising direct connections and connections through inverters; whereby

said output computation means is a combinational circuit receiving signals from said left input lead, said right input lead, said first function value unit, and said second function value unit, and sending its output signal directly to said output lead via said interconnection means, the value of said output signal being equal to $xy + xyv_{10} + xyv_{01}$, where x is the value on said left input lead, y is the value on said right input lead, v_{10} is the value of the output of



said first function value unit means, and v_{01} is the value of the output of said second function value unit means;

and whereby said first and second function value unit means are connected via said interconnection means to said control signal input means;

and whereby

said first function value unit means can change its internal state, which determines its output, only when a clock pulse occurs on said clock lead while x is ONE and y is ZERO, and said second function value unit means can change its internal state, which determines its output, only when a clock pulse occurs on said clock lead while x is ZERO and y is ONE;

and whereby

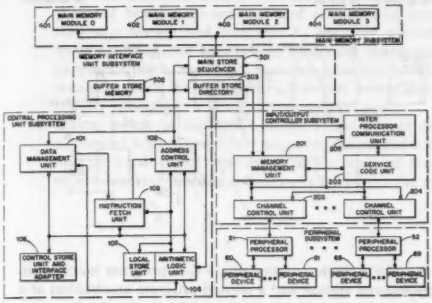
the output of said first heuristic responsibility unit means is connected via said interconnection means directly to said left heuristic responsibility output lead, and the output of said second heuristic responsibility unit means is connected via said interconnection means directly to said right heuristic responsibility output lead;

and whereby a change of state of said first and second function value unit means and said first and second heuristic responsibility unit means may occur only at the occurrence of a clock pulse on said clock lead while the value on said heuristic responsibility input lead is a certain fixed value indicating "heuristic responsibility" of said element for the current input n-tuple presented to the machine during training.

3,934,232
INTERPROCESSOR COMMUNICATION APPARATUS FOR A DATA PROCESSING SYSTEM

John L. Curley, Sudbury, and Roger R. Richard, Chelmsford, both of Mass., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Apr. 25, 1974, Ser. No. 463,946
Int. Cl.² G06F 9/18
U.S. Cl. 340—172.5 **8 Claims**



1. In a data processing system having at least two processing units, each processing unit having a plurality of common logical resources which may be utilized by the other processing unit, apparatus for enabling synchronization of the utilization of said common logical resources between said processing units, said apparatus comprising:

a plurality of pairs of bistable indicating means, each of said pairs of said plurality of bistable indicating means corresponding to a one of said resources, one bistable indicating means of each of said pairs corresponding to one processing unit, the other bistable indicating means of each of said pairs corresponding to the other processing unit,

first means responsive to said one processing unit for selecting one of said resources and for setting the corresponding one of said plurality bistable indicating means,

second means responsive to said other processing unit for selecting one of said resources and for setting the corresponding one of said plurality of bistable indicating means, and

third means responsive to said pairs of bistable indicating means for preventing said first means and said second means from setting the corresponding one of said pair of bistable indicating means for said one resource when the other of said pair of bistable indicating means is already set,

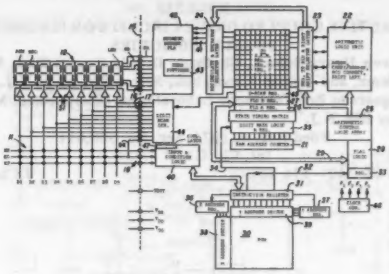
whereby priority for utilization of said resource is provided.

3,934,233
READ-ONLY-MEMORY FOR ELECTRONIC CALCULATOR

Roger J. Fisher, and Gerald D. Rogers, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 24, 1973, Ser. No. 400,471
Int. Cl.² G11C 13/00
U.S. Cl. 340—173 R **12 Claims**

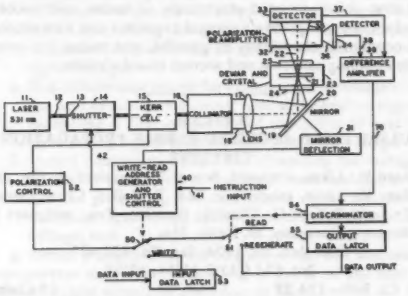
1. In a small, portable, battery-operated electronic calculator of the type implemented in large-scale-integrated semiconductor means: a read-only-memory of storing a plurality of instruction words for defining the operation of the system, comprising an array of rows and columns of memory cells and row lines and column lines associated with the array, the column lines being partitioned in groups to provide bits of the instruction word on output lines, each group consisting of an output line and a ground line with a plurality of intermediate column lines between the output line and the ground line, there being only one ground line for each group of column lines, column select means receiving an address signal for selecting a particular column in each group and connecting the column line on one side of the selected column to the ground line for such group and connecting the column line on the other side of the selected column to an output line for such group, row select means receiving an address signal for selecting a particular row line including a precharged decode array isolated from all of the row lines except the selected one, and means for precharging the column lines prior to connection of a column line to a ground line.



3,934,234
PHOTODICHROIC READOUT DEVICE USING CIRCULARLY POLARIZED LIGHT

James Vinton Burt, Wilmington, Del., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 5, 1974, Ser. No. 486,126
Int. Cl.² G11C 11/42, 13/04
U.S. Cl. 340—173 CC **9 Claims**



1. An improved photodichroic readout device for detecting information stored in a photodichroic crystal memory unit comprising:

a. a source of a coherent light beam for projecting said beam along a first path;

b. means for circularly polarizing said coherent beam in said first path and for projecting said circularly polarized coherent beam in a controlled manner along a second path;

c. a material having photodichroic properties as a storage unit in said second path of said beam;

d. polarization beam splitter means positioned to receive said beam of light that has passed thru said photodichroic material and splitting said beam dependent upon said beam's vertical or horizontal polarization of said beam;

e. first and second detector means positioned to receive said horizontal or vertical beams, said detectors having electrical outputs;

f. said electrical outputs coupled to a difference amplifier; and,

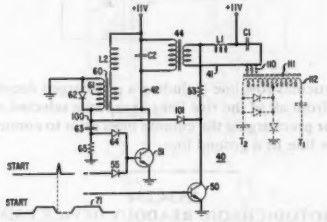
g. means for taking the output of said difference amplifier and displaying the information that is stored in said photodichroic material.

3,934,235

REACTIVE COUPLED DRIVE CIRCUIT FOR MAGNETIC BUBBLE MEMORIES

Andrew Henry Bobeck, Chatham; Donald Eugene Kish, Middlesex, and Roman Kowalchuk, Somerville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 4, 1974, Ser. No. 520,611
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF 7 Claims



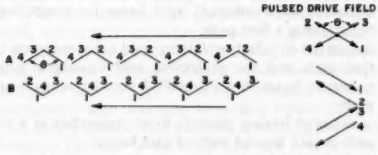
1. A combination comprising a field-access magnetic bubble memory in which bubbles may be made to move in a plane of movement and a driver circuit having first and second coils for providing a magnetic field reorienting in said plane, said driver circuit further comprising first and second tuned circuits, said first tuned circuit comprising a first capacitor and said first coil connected electrically in series, said second tuned circuit comprising a second capacitor and said second coil connected electrically in parallel, and means for reactively coupling said first and second tuned circuits.

3,934,236

PULSED FIELD ACCESSED BUBBLE PROPAGATION CIRCUITS

Howard H. Aiken, deceased, late of Ft. Lauderdale, Fla. (by Mary E. Aiken, executrix); Paul T. Bailey, Creve Coeur, Mo., and Robert C. Minnick, Houston, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 11, 1974, Ser. No. 432,437
Int. Cl.² G11C *11/14*, *19/08*
U.S. Cl. 340—174 TF 15 Claims



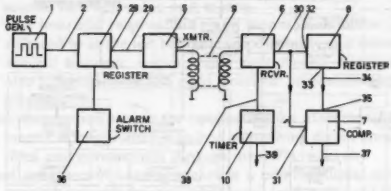
1. A magnetic bubble propagation system, comprising a field-accessed bubble overlay pattern and means for generating a repetitive sequence of reversing pairs of pulsed field orientations realigning consecutively with mutually oblique axes parallel to the plane of said overlay pattern.

3,934,237

ALARM DEVICE

Bjorn Gysell, Huddinge, and Matz Pehrsson, Linkoping, both of Sweden, assignors to Bevaknings AB Securitas, Stockholm, Sweden

Filed Mar. 6, 1974, Ser. No. 448,579
Claims priority, application Sweden, Mar. 12, 1973, 7303450
Int. Cl.² G08B *26/00*
U.S. Cl. 340—213 R 4 Claims



1. An alarm device comprising a first program mechanism at a monitored station and a second program mechanism at a central monitoring station, which program mechanisms are arranged to transmit control signals in accordance with a predetermined signal pattern to a signal comparison circuit arranged to generate an alarm signal when the received control signals differ from one another, the first and the second program mechamisms being provided with identical electric shift registers with a plurality of binary denominational steps and identically connected feed-back networks, each program mechanism being arranged to generate a binary one or zero signal in dependence on the content of the respective shift register, said binary signals constituting discrete control signals, the control signal from the first program mechanism being coupled to a transmitter at said monitored station arranged to transmit an analogous signal to a receiver at the central monitoring station, which receiver converts the analogous signal to an output signal identical with the original binary control signal, which output signal is coupled to the second program mechanism to step the shift register thereof to generate a control signal, which together with the output signal of the receiver, is coupled to the signal comparison circuit, and wherein a timing mechanism is arranged to generate an alarm signal in the absence of an output signal from the receiver after a predetermined period of time.

3,934,238

DIFFERENTIAL PRESSURE VISUAL AND AUDIBLE WARNING SIGNAL DEVICE FOR HYDRAULIC AND PNEUMATIC SYSTEMS

George S. Pavlou, Madison, Wis., assignor to Ambac Industries, Inc., Carle Place, N.Y.

Filed Mar. 4, 1975, Ser. No. 555,158
Int. Cl.² G08B *21/00*; B01D *35/14*
U.S. Cl. 340—239 F 13 Claims

12. A differential pressure warning signal device for use in fluid power systems employing an hydraulic or pneumatic fluid power medium comprising:

a. a housing adapted to be arranged in and in communication with the fluid power system and including a body having therein

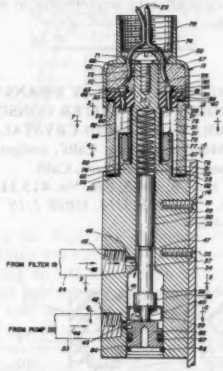
1. an internal cylindrical cavity;

2. a piston unit including a piston head movably mounted in the said cylindrical cavity;

3. a high pressure inlet in the said body of the said housing for the flow of the fluid power from the system into the said cylindrical cavity below the said piston head;

4. a low pressure inlet in the body of the said housing for the flow of the fluid power from the system into the said cylindrical cavity above the said piston head;

b. stationary electrical contact means in the said housing adapted to be connected to an electrical circuit which includes an electrically actuatable warning signal device;
c. a first magnetic means movably mounted in the said housing above and in coaxial alignment with the said piston unit;
d. a second and torroidal magnetic means movably mounted in the said housing radially outwardly of the said first magnetic means;
e. movable electrical contact means movably mounted in the said housing above the said second and torroidal magnetic means and movable by the said second and torroidal magnetic means into electrical contacting engagement with the said stationary electrical contact means to close the said electrical circuit to the said electrically actuatable warning signal device; and
f. spring means in the said housing above and in coaxial alignment with the said first magnetic means and with the said piston unit and coacting with the force of the fluid power entering the said cylindrical cavity from the system



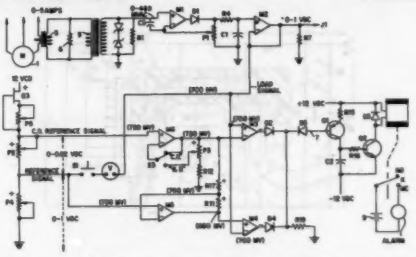
by way of the said low pressure inlet to urge the said piston unit downwardly in the said piston cylinder against the action of the upward force of the said fluid power entering the said cylindrical cavity from the system by way of the said high pressure inlet below the said piston head so as to maintain a static or balanced condition between the combined downward forces of the said spring means and the fluid power from the said low pressure unit tending to urge the said piston unit downwardly in the said cylindrical cavity against the upward force of the fluid power entering the said housing by way of the said high pressure fluid power tending to raise the said piston unit in the said cylindrical cavity whereby when the said static or balanced condition is maintained the said movable contact means is disposed out of electrical contacting engagement with the said stationary electrical contact means and the said electrical circuit to the said electrically actuatable warning signal device remains open and said electrically actuatable warning signal device remains inactive.

3,934,239

ADJUSTABLE ELECTRONIC LOAD-ALARM RELAY

Charles H. Mason, Paducah, and Roy S. Sitton, Kevil, both of Ky., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 27, 1974, Ser. No. 509,996
Int. Cl.² G08B 21/00
U.S. Cl. 340—248 A 10 Claims



1. An alarm circuit for monitoring an electrical current and actuating an alarm if the value of said current varies from a selected operating range comprising
a. means for generating a DC signal voltage continuously proportional to said current;
b. means for generating at an output a first constant DC reference voltage which exceeds a preselected value of said signal voltage by a selected amount;
c. a series circuit comprising a first resistor connected to a second resistor, one end of said series circuit being connected to the output of said means for generating the first reference voltage;
d. means for generating at an output a second constant DC reference voltage which is lower than said preselected value by a selected amount and for impressing the second reference voltage on the other end of said series circuit while maintaining the junction of the first and second resistors of said series circuit at a DC voltage equal to said signal voltage;
e. first comparator means for comparing the voltage at said one end of said series circuit with said signal voltage and generating a first output signal indicative of said load signal being higher than the first reference voltage;
f. second comparator means for comparing the voltage at said other end of said series circuit with said signal voltage and generating a second output signal indicative of said load signal being lower than the second reference voltage; and
g. means connected to the outputs of the first and second comparator means for rseponding to either of the first and second output signals by actuating an alarm.

3,934,240

TIMER FOR TELEPHONE TOLL CALLS AND THE LIKE

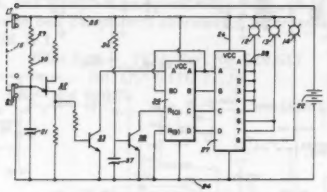
Marshall F. Norling, 9195 E. Oxford Drive, Denver, Colo. 80201

Continuation of Ser. No. 231,554, March 3, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,907
Int. Cl.² G08B 5/36
U.S. Cl. 340—309.4 4 Claims

1. As an article of manufacture, a self-contained timer unit for timing telephone toll calls and the like comprising a closed housing of a size readily usable on a desk or the like adjacent a telephone instrument, said article comprising:
first, second and third light emitting signal elements on said timer for indicating respectively and in order the beginning of a predetermined time period and the passage of an intermediate time period and the termination of said predetermined time period;

an electric battery mounted within said housing, timing means including solid state timing circuitry within said housing and utilizing said battery as its energy source for actuating said light emitting signal elements in order; and

switching means for initiating operation of said timing means, said switching means including a starting element mounted on said housing and accessible from the outside thereof, and said starting element upon actuation connecting said timing means to said battery for energization



first circuit connecting means in said timing means operative to energize said first signal element only immediately upon actuation of said switching means,

second circuit connecting means in said timing means operative after the passage of said intermediate time period simultaneously to deenergize said first signal element and to energize said second signal element only, and

third circuit connecting means in said timing means operative after the passage of said predetermined time period simultaneously to deenergize said second signal element and to energize said third signal element only.

3,934,241

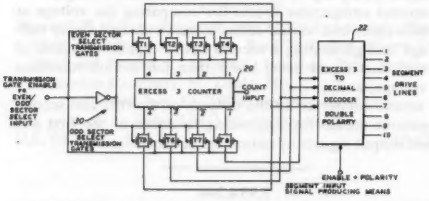
ANALOG DISPLAY UTILIZING LIQUID CRYSTAL MATERIAL AND FOR BEING MULTIPLEXED WHEREIN ONE GROUP OF ELECTRODES ARE ARRANGED OPPOSITE A GROUP OF COUNTER-ELECTRODES

Hans Weigert, Woodcliff Lake, N.J., assignor to Ragen Precision Industries, Inc., North Arlington, N.J.

Filed Nov. 13, 1974, Ser. No. 523,341

Int. Cl.[2] G02F 1/18

U.S. Cl. 340—324 R **3 Claims**


EVEN SECTOR SELECT TRANSMISSION GATES
TRANSMISSION GATE ENABLE
VS EVEN/ ODD SECTOR SELECT INPUT
EXCESS 3 COUNTER
COUNT INPUT
ODD SECTOR SELECT TRANSMISSION GATES
EXCESS 3 TO DECIMAL DECODER
DOUBLE POLARITY
SEGMENT DRIVE LINES
ENABLE + POLARITY SEGMENT INPUT SIGNAL PRODUCING MEANS

1. Analog display utilizing liquid crystal material and for being multiplexed, comprising:

a plurality of groups of segments disposed adjacent to each other in a predetermined pattern, with regard to a predetermined direction, the segments in each group being disposed of in a sequence opposite to the sequence in which the segments of the next adjacent group are disposed, and each segment in each group corresponding to one of the segments in each of the other groups and all corresponding segments in all groups being connecting electrically in a series connection;

a plurality of sectors disposed adjacent to each other and in said predetermined pattern, each of said sectors disposed opposite to one of said groups of segments and displaced therefrom;

a body of liquid crystal material disposed between said plurality of groups of segments and said sectors;

a first plurality of input leads, each of said input leads being connected electrically with one of said series connections of said corresponding segments; and

a second plurality of input leads, each of said input leads being connected electrically to one of said sectors, wherein said body of liquid crystal material is in a first optical state and wherein each portion of said body of liquid crystal material disposed between one of said segments and one of said sectors is capable of changing into a second optical state upon an electric field being established thereacross by a first input signal being applied to said one segment and by a second input signal being applied to said one sector, and said analog display further comprising;

means for applying first input signals to said first plurality of input leads in a first predetermined sequence with regard to said predetermined direction upon a second input signal being applied to a predetermined one of said sectors, and for applying said first input signals to said first plurality of input leads in a sequence opposite to said first predetermined sequence and with regard to said predetermined direction upon said second input signal being applied to the sector next adjacent to said predtermined one of said sectors whereby the portions of said body of liquid crystal material disposed between said segments and said sectors change from said first optical state into said second optical state sequentially in said predetermined direction.

3,934,242

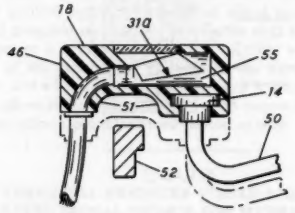
ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES USING A MATRIX ARRAY OF LIQUID-CRYSTAL DEVICES

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,112

Int. Cl.[2] G06F 3/14; G02F 1/18

U.S. Cl. 340—324 R **2 Claims**



1. A device for displaying alphanumeric indicia at selected key buttons of a keyboard of a typewriter console forming an I/O link with a general-purpose digital computer, each alphanumeric indicium being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby said font operational characteristic is permanently recorded on paper at said typewriter console in full view of said human observer-user through mechanical button-font-paper interaction, comprising:

a. sets of liquid-crystal devices, each set being arranged to display at or adjacent to at least one of said selected key buttons said alphanumeric indicium associated with said font operational characteristic;

b. elongated rigid cantilevered frame means attached to and supportive of said sets of liquid-crystal device, said frame means including cooperative gripping means in contact with corresponding key buttons of said keyboard;

c. controller switch means connected to said sets of liquid-crystal devices and including digital controller-decoder means for repetitively generating a binary activation code

for each set at a rate sufficiently above the flicker fusion rate of the human eye to display said desired alphanumeric display indicium as a solid image to said observer-user, said displayed alphanumeric indicium being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background lighting environment thereabout.

3,934,243

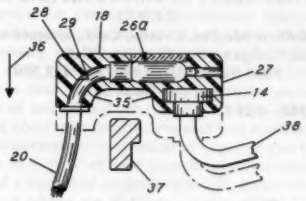
ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES USING A PLURALITY OF GASEOUS GLOW INDICATOR TUBE MEANS CONTAINING AN IONIZABLE GAS

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,113

Int. Cl.² G06F 3/14

U.S. Cl. 340—324 R **2 Claims**



1. A device for displaying alphanumeric light-emanating indicia at selected key buttons on a keyboard of a typewriter console forming an I/O link with a general purpose digital computer, each light-emanating alphanumeric indicium being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby accurate permanent recordation on paper through mechanical button-font-paper interactions of said font characteristic occurs, comprising;

a. a set of gaseous glow indicator tube means each comprising a plurality of indicia-shaped indicator cathode electrodes stacked one above the other surrounding a single anode electrode, deployed within a transparent bulbous envelope containing an ionizable gas, said envelope being positioned to display at or adjacent to at least one of said selected key buttons to said observer-user said light-emanating alphanumeric indicium associated with said font operational characteristic;

b. elongated rigid cantilevered frame means attached to and supportive of each of said gaseous glow indicator tube means, said frame means including cooperative means in gripping contact with corresponding key buttons of said keyboard;

c. controller switch means operatively connected to said set of indicator tube means and including cooperative means for generating a series of signals for energization of selected cathode and anode electrodes of said indicator tube means so as to provide gas glow thereabout in patterns corresponding to said alphanumeric display indicia for which display is sought, said displayed alphanumeric indicia being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background lighting environment thereabout.

3,934,244

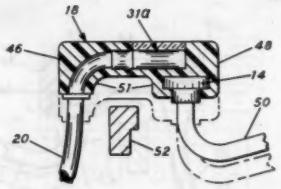
ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES USING FLUORESCENT LUMINESCENT ALPHANUMERIC INDICATING MEANS

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,114

Int. Cl.² G06F 3/14

U.S. Cl. 340—324 R **2 Claims**



1. A device for displaying alphanumeric light-emanating indicia at selected key buttons of a keyboard of a typewriter console forming an I/O link with a general purpose digital computer, each light-emanating alphanumeric indicium being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby said font operational characteristic is permanently recorded on paper at said typewriter console in full view of said human observer-user through mechanical button-font-paper interaction, comprising:

a. a set of luminescent indicator means positioned at or adjacent to said selected key buttons, each of said set of luminescent indicator means comprising an elongated insulated base plate surrounded by transparent envelope means, anode means attached to said insulated plate and an array of separately-energizable fluorescent cathode segments arranged in a selected configuration on a common side of said insulated plate adjacent to said anode means;

b. elongated rigid cantilevered frame means attached to and supportive of each of said indicator means, said frame means including cooperative gripping means in contact with a corresponding key button of said keyboard;

c. controller switch means connected to said set of indicator means and including cooperative means for energizing selected cathode segments and anode means of at least one of said each indicator means so as to provide fluorescent glow therefrom in a pattern corresponding to said alphanumeric display indicia for which display is sought, said alphanumeric indicia also being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background lighting environment thereabout.

3,934,245

ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,115

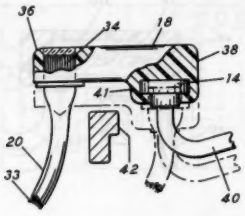
Int. Cl.² G06F 3/14

U.S. Cl. 340—324 R **3 Claims**

1. A device for displaying alphanumeric light-emanating indicia at selected key buttons of a keyboard of a typewriter console forming an I/O link with a general-purpose digital computer, each light-emanating alphanumeric indicum being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby said font operational characteristic is permanently recorded on paper at said typewriter

console in full view of said human observer-user through mechanical button-font-paper interaction, comprising

a. an array of fiber optic, light-conducting members having near ends arranged to display at or adjacent to at least one of said selected key buttons said light-emanating alphanumeric indicium associated with said font operational characteristic, said alphanumeric indicium being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background lighting environment thereabout;



b. elongated rigid cantilevered frame means attached to and supportive of said array, said frame means including cooperative means in gripping contact with corresponding key buttons of said keyboard;

c. incandescent bulb means positioned at remote ends of said array of fiber optic, light-conducting members; and

d. optical encoding means operatively connected to said array of fiber optic members and including cooperative means for aiding in the controlled generation of a series of encoded light signals which fall on more remote ends of said fiber optic, light conducting members in a pattern corresponding to said alphanumeric indicium for which display is sought.

3,934,246

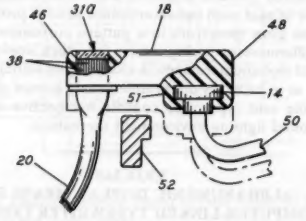
ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES USING LIGHT-EMITTING DIODES (LED'S) IN CONJUNCTION WITH SETS OF FIBER-OPTIC MATRIX MEMBERS

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,145

Int. Cl.[2] G06F 3/14

U.S. Cl. 340—324 R **3 Claims**



1. A device for displaying alphanumeric light-emanating indicia at selected key buttons of a keyboard of a typewriter console forming an I/O link with a general purpose digital computer, each light-emanating alphanumeric indicium being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby said font operational characteristic is permanently recorded on paper at said typewriter console in full view of said human observer-user through mechanical button-font-paper interaction, comprising

a. an array of sets of fiber optic, light-conducting members having near ends arranged to display at or adjacent to at least one of said selected key buttons said light-emanating alphanumeric indicium associated with said font operational characteristic;

b. elongated rigid cantilevered frame means attached to and supportive of said near ends of said sets of fiber optic, light-conducting members, said frame means including cooperative support means in gripping contact with a corresponding key button of said keyboard;

c. a set of light-emitting diodes (LED's) positioned at opposite ends of said sets of fiber optic, light-conducting members, and

d. encoding means operatively connected to said sets of fiber optic members for controlling passage of light therealong and including cooperative drum means for aiding in the controlled generation of a series of encoded light signals corresponding to said alphanumeric indicium for which display is sought, said indicium being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background lighting environment thereabout.

3,934,247

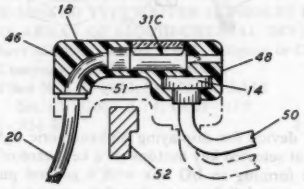
ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES USING A MATRIX ARRAY OF LIGHT-EMITTING DIODES (LED'S)

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,280

Int. Cl.[2] G06F 3/14

U.S. Cl. 340—324 R **2 Claims**



1. A device for displaying alphanumeric light-emanating indicia at selected key buttons of a keyboard of a typewriter console forming an I/O link with a general-purpose digital computer, each light-emanating alphanumeric indicium being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby said font operational characteristic is permanently recorded on paper at said typewriter console in full view of said human observer-user through mechanical button-font-paper interaction, comprising

a. semiconductor, light-emitting diode means arranged to display at or adjacent to at least one of said selected key buttons said light-emanating alphanumeric indicium associated with said font operational characteristic;

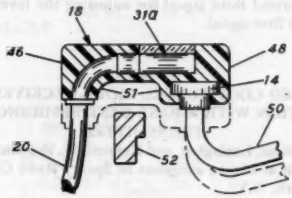
b. cantilevered elongated rigid frame means attached to and supportive of said light-emitting diode means, said frame means including cooperative means in gripping contact with corresponding one or more key buttons of said keyboard;

c. controller switch means connected to said light-emitting diode means and including digital controller-decoder means for repetitively generating binary activation codes for said diode means at a rate sufficiently above the flicker fusion rate of the human eye to display said desired alphanumeric display indicium as a solid image to said observer-user, said displayed indicium being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background of lighting environment thereabout.

3,934,248
ALPHANUMERIC DISPLAY MEANS FOR COMPUTER-LINKED TYPEWRITER CONSOLES USING A PLURALITY OF PLANAR GASEOUS DISCHARGE MEANS WITHIN A UNITARY ENVELOPE CONTAINING AN IONIZABLE GAS

Thomas Delbert Mueller, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,281
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 R **2 Claims**



1. A device for displaying alphanumeric light-emanating indicia at selected key buttons of a keyboard of a typewriter console forming an I/O link with a general-purpose digital computer, each light-emanating alphanumeric indicium being related to a font operational characteristic resulting from movement of one of said selected key buttons under control of a human observer-user whereby said font operational characteristic is permanently recorded on paper at said typewriter console in full view of said human observer-user through mechanical button-font-paper interaction, comprising

a. a set of planar gas discharge means within transparent envelope means, each comprising at least a pair of side-by-side indicator segments aligned on one side of a common planar base plate formed of insulating material, each indicator segment including a plurality of cathodes deployed in a selected configuration of said base plate, and barrier-anode segments surrounding a selected number of said plurality of cathodes, for display at or adjacent to at least one of said selected key buttons said light-emanating alphanumeric indicia associated with said font operational characteristic of interest;

b. cantilevered elongated rigid frame means attached to and supportive of said planar gas discharge means, said frame means including cooperative means in gripping contact with a corresponding key button of said keyboard;

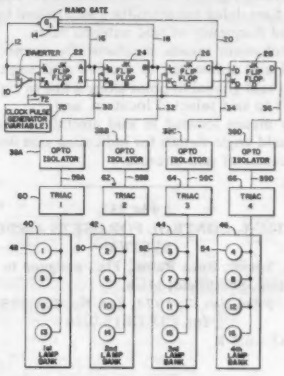
c. controller switch means connected to said set of planar gas discharge means and including cooperative means for generating a series of activation signals for energization of a selected cathode and barrier-anode segment pair of at least one of said each planar gas discharge means so as to provide a gas glow thereabout, in a pattern of light corresponding to said alphanumeric indicia sought to be displayed, said indicia being of sufficient intensity so as to be easily discernible to said human observer-user using said typewriter console irrespective of the background lighting environment thereabout.

3,934,249
BORDER FLASHERS

James Sanjana, Mississauga, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 13, 1974, Ser. No. 450,737
Int. Cl.² G09F 13/00
U.S. Cl. 340—340 **6 Claims**

1. A source of electric power, lamp means for connection to said source of electric power for being energized thereby to produce illumination, major electric and electric switch means connected to said source of electric power and said lamp means for controlling the flow of current to said lamp means, electronic gate means for blocking said current flow, and illumination control and regulating means connected to said lamp means and said major switch means for controlling the

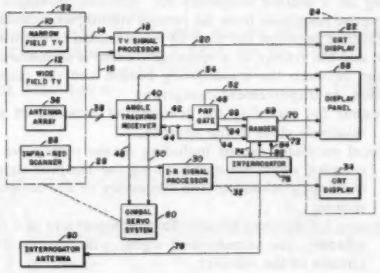


turning on and off of said lamp means, timed pulse generating means, said control and regulating means being constructed and arranged for predetermining the timing and duration of said periods of turning on and off of said lamp means.

3,934,250
HELICOPTER BLIND LANDING AND HOVER SYSTEM

Oscar M. Martin, Jr., Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 7, 1974, Ser. No. 477,374
Int. Cl.² G01S 9/56
U.S. Cl. 343—6 ND **12 Claims**



1. A system providing information for pointing an aircraft at a selected location, comprising:

a gimbal having three-degrees of freedom mounted aboard said aircraft,

an interferometric antenna array mounted on said gimbal for receiving signals of a selected frequency.

said antenna array comprising a plurality of antenna elements arranged symmetrically in a right angle pattern having horizontal and vertical legs, with the antenna elements in each leg being selectively rendered effective in order to provide both coarse and fine directional information,

a radar receiver having inputs connected to said antenna array for producing angle signals indicating the line of sight to said selected location,

a transmitter connected to receive said angle signals from said receiver for transmitting a pulsed signal having a selected frequency,

a transponder placed at said selected location for receiving said pulsed signal from said transmitter and after a selected time delay retransmitting said pulsed signals at said selected frequency of said antenna array,

servo-mechanism means mechanically connected to said gimbal and connected to receive said angle signals for driving said gimbal to point along a line of sight from said aircraft to said selected location, and

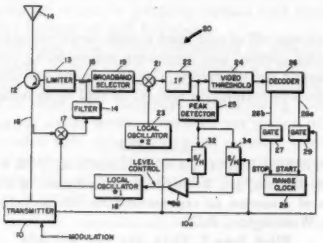
indicator means located in said aircraft connected to receive said angle signals for indicating said line of sight to an operator of said aircraft.

3,934,251

AUTOMATIC T_0 CONTROL FOR USE IN AIRBORNE DME SYSTEM

Brendan J. Spratt, Boca Raton, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 7, 1974, Ser. No. 521,593
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 R **14 Claims**



1. In distance measuring equipment which includes a transmitter and antenna for transmitting on a first frequency an interrogation message to a remote station and a receiver operating on a second frequency for receiving messages which comprise responses from the remote station, wherein the time difference between the time of transmission of an interrogation and the receipt of a response thereto is a measure of the range between the transmitting station and the responding station, an improvement comprising:

means for sampling the transmitted message at a point relatively close to the antenna;

local oscillator means including means responsive to the sampled signal for transforming the sampled signal to a frequency related to the frequency of the expected response;

means for injecting the transformed signal into said receiver whereby the transformed signal will traverse through circuits of the receiver;

decoding means responsive to the transformed signal traversing the receiver circuits for generating a first signal; and,

processing means energized to a first state by said first signal, said processing means being subsequently energized to a second state by a second signal comprising a response from said remote station traversing the receiver circuits and decoded by said decoding means.

14. In distance measuring equipment which includes a transmitter and antenna for transmitting on a first frequency an interrogation message to a remote station, and a receiver means operating on a second frequency for receiving messages which comprise responses from the remote station, wherein the time difference between the time of transmission of an interrogation and the receipt of a response thereto is a measure of the range between the transmitting station and the responding station, an improvement comprising:

means for injecting a first signal corresponding to a sample of the first frequency into said receiver means whereby the first signal will traverse through circuits of said receiver;

first memory means responsive to the transmission of an interrogation message for memorizing a second signal corresponding to the signal strength of the first signal in said receiver means;

second memory means responsive for memorizing a third signal corresponding to the signal strength of a response in said receiver means; and,

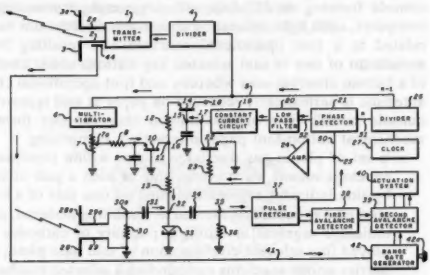
means comparing the memorized second signal with the memorized third signal for adjusting the level of the injected first signal.

3,934,252

CLOSED LOOP TUNNEL DIODE RECEIVER FOR OPERATION WITH A BASE BAND SEMICONDUCTOR TRANSMITTER

Gerald F. Ross, Lexington, and Kenneth W. Robbins, Wilmington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,967
Int. Cl.² G01S 9/12; H04B 1/38
U.S. Cl. 343—7 VM **7 Claims**



1. In a base band radio object detection system:

transmitter means for transmitting base band pulse signals toward an object,

wide band transmission line receiver means for receiving said base band pulse signals after reflection from said object and for propagating received base band pulses substantially without distortion thereof,

tunnel diode means having first and second terminal means coupled across said wide band transmission line receiver means and having first and second conductivity states, said tunnel diode means being characterized by shifting from said first to said second conductivity state in response to the presence of one of said propagating base band pulse signals at said first terminal means,

pulse shaping means having an input coupled to said first terminal means,

pulse phase detector means responsive to said pulse shaping means and to master synchronizer means for providing a control signal,

constant current circuit means responsive to said control signal for periodically charging capacitor means,

discharge circuit means responsive to said pulse shaping means for periodically discharging said capacitor means,

circuit means for coupling said capacitor means to said first terminal means for supplying a saw tooth wave form signal thereto,

range gate signal generator means responsive to said transmitter means for generating range gate signals,

detector means responsive to said pulse shaping means and to said range gate signal generator means for producing an actuating output when said one of said propagating base band pulses at said first terminal falls in time within

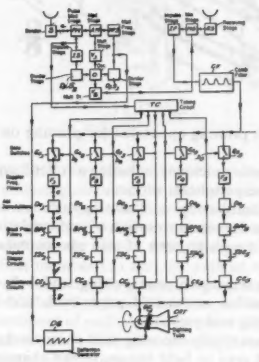
one of said range gate signals, and
actuator means responsive to said actuating output.

3,934,253

DOPPLER FREQUENCY RADAR SYSTEM WITH VERY SHORT PULSE MODULATED HIGH FREQUENCY CARRIER WAVES

Kurt Wiedemann, Munich, and Karl-Ludwig Lenz, Munich-Solln, both of Germany, assignors to Siemens & Halske Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 10, 1961, Ser. No. 88,581
Claims priority, application Germany, Feb. 11, 1960, 67062
Int. Cl.² G01S 9/42
U.S. Cl. 343—7.7 **9 Claims**



1. A doppler frequency radar system, comprising means for generating a high frequency carrier wave, means for amplitude modulating said carrier wave at a relatively low frequency, means for also amplitude modulating such carrier wave to produce short impulses of relatively high pulse sequence frequency, means for radiating said modulated carrier wave toward a moving object, means for receiving such wave as reflected from such a moving object, means for generating accurate timing pulses, means forming a plurality of distance measuring branch circuits, means operatively connected to said timing pulse generating means, and controlled by such pulses, for operatively connecting the receiving means to the respective branch circuits, operative to distribute said received impulses in accordance with the time relation of the received impulses to the timing pulses, means in each branch circuit for demodulating the pulses appearing therein and to form rough distance measuring pulses, means in each branch circuit forming a coincidence circuit and operatively connected to said timing pulse generating means whereby said coincidence circuit is operable to form, responsive to coincident occurrence of the respective rough distance measuring pulses and the timing pulses fine measuring pulses which assure unequivocal distance indication even in the presence of high pulse sequence frequency.

3,934,254

RELIABLE CYCLE SELECTION IN LORAN-C SYSTEM

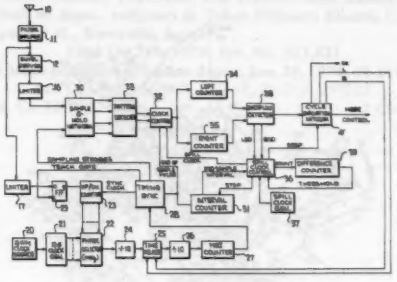
William K. Vogeler, Springfield, and Donald E. Shorter, Leesburg, both of Va., assignors to Telcom, Inc., McLean, Va.

Filed Sept. 3, 1974, Ser. No. 502,551
Int. Cl.² G01S 1/24
U.S. Cl. 343—103 **15 Claims**

15. In a LORAN-C receiver, a method for locating and tracking with a tracking gate a particular zero crossover point in the carrier of a received LORAN-C pulse, said method being characterized by the steps of:

generating an envelope-derived signal from said received pulses wherein a carrier phase reversal is provided at said particular zero-crossover point;

repetitively sampling the same plurality of half cycles of said envelope-derived signal for multiple received LORAN-C pulses;



comparing said samples to pre-stored data to determine whether the tracking gate is earlier or later than said carrier phase reversal;

registering the difference between early and late determinations made during said multiple received pulses; and

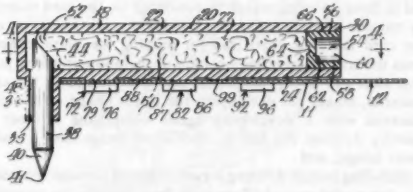
re-positioning the tracking gate earlier or later in accordance with the size and sense of said difference.

3,934,255

RECORDER PEN

Guy A. Taylor, Batavia, Ill., assignor to Sanford Research Company, Bellwood, Ill.

Continuation of Ser. No. 392,968, Aug. 30, 1973, abandoned.
This application June 3, 1974, Ser. No. 475,957
Int. Cl.² G01D 15/16
U.S. Cl. 346—140 A **19 Claims**



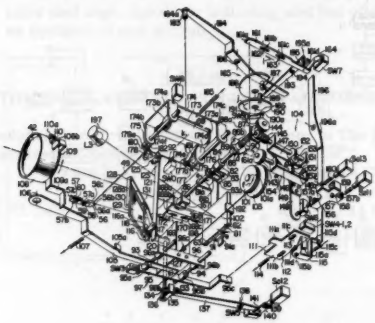
1. In a recorder pen for a recording instrument comprising a tube having a chamber, means for maintaining a supply of fluid in said chamber and a writing nib carried by the tube in communication with said fluid in combination with mounting means carried by said tube and having support walls spaced from said tube to provide an arm entering opening therebetween, said mounting means having web means extending into the opening between said tube and said support walls, whereby an arm end deflects a portion of said web means for securing said pen onto said arm.

3,934,256

IDENTIFICATION CARD PRODUCING APPARATUS

Kenji Isonaka, Tokorozawa; Saburo Hokari, Kawasaki; Tatsuya Watanabe, Yokohama, and Masamichi Furukawa, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,245
Claims priority, application Japan, May 23, 1972, 47-51010
Int. Cl.² G03G *15/22*
U.S. Cl. 354—3 7 Claims



1. Apparatus for producing identification cards comprising: positioning means for placing a relatively stiff sheet of card material at a transfer-printing position, a substantially flat photoreceptor comprising a photoelectric material layer disposed on a conductive supporter, means for poositioning the photoreceptor at a photographing position, charging means for uniformly charging the photoconductive layer of said photoreceptor when the photoreceptor is at its photographing position, means for exposing the charged photoconductive material layer of the photoreceptor to an optical image to form an electrostatic latent image on the photoconductive material layer when the photoreceptor is at its photographing position, means for moving the charged and exposed photoconductive layer to a transfer-printing position at which it is adjacent to and facing the card material, transfer-printing means for pressing the photoreceptor and the card material against each other and for thereby transferring the electrostatic latent image from the photoreceptor to the card material to form an electrostatic latent image on the card material by transfer-printing, means for moving the photoreceptor and the card material apart and for moving the photoreceptor from the transfer-printing position to the photographing position after the latent image has been transferred to the card material, means for developing the latent image on the card material with a developing agent comprising a toner to thereby develop the last recited latent image into a visible toner image, and

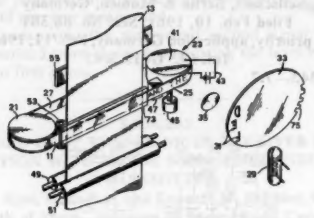
including means defining a card material passage for inserting a card material forwardly from outside the apparatus toward said transfer printing position of the card material, stopper means and spring means urging the stopper means into the card material passage, said stopper means having an inclined edge for moving the stopper means out of the card material passage as a card material is inserted into the apparatus and having a straight edge facing the transfer-printing position of the card material, and push-back means for pushing the card material which has been inserted into the apparatus and has passed said stopper means back towards the stopper means and against said straight edge of the stopper means to thereby position the card at said transfer-printing position.

3,934,257

NON-IMPACT PRINTER

Arnaldo Pasini, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed Aug. 26, 1974, Ser. No. 500,826
Claims priority, application Italy, Aug. 28, 1973, 69571/73
Int. Cl.² B41B *13/00*
U.S. Cl. 354—5 11 Claims



1. Non-impact printing apparatus for printing on plain paper comprising:

a photoconductive element including a roller having a photoconductive peripheral surface;

a transparent belt having an insulating surface tracked over said roller and wherein a portion of said insulating surface is in contact with an area of said photoconductive element;

means for incrementally transporting said belt in a path from said roller across said paper with said insulating surface facing said paper;

means for sequentially exposing said photoconductive surface at said area to light images of the characters to be printed on said paper;

means for applying a voltage across said photoconductive surfaces and said portion of said transparent belt in contact therewith during the exposure of said element to said light images, said transporting means incrementing said belt after each exposure to the light image of a character for forming on said belt the electrostatic latent image of a line of characters to be printed on said paper;

developing means disposed between said roller and said paper for developing the latent images on said belt with a toner, the line of toner developed characters being visible through said transparent belt;

means for transferring said line of toner developed characters from said belt to said paper; and

means for line spacing said paper.

3,934,258

EXPOSURE STORAGE DEVICE

Shigeo Ono, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 12, 1974, Ser. No. 441,854
Claims priority, application Japan, Feb. 10, 1973, 48-20491[U]
Int. Cl.² G03B *7/08, 17/00*
U.S. Cl. 354—60 R 5 Claims

1. An improved exposure value storage device for a photographic camera of the type having a metering circuit (11) for electrically measuring the brightness of an object to be photographed:

a storage circuit (12) for storing the output of said metering circuit (11);

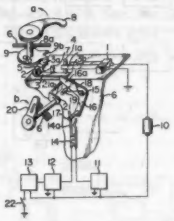
a storage switch (14) for electrically disconnecting said metering circuit and said storage circuit (12) to cause said storage circuit (12) to store an exposure value;

a control switch (13) for controlling exposure in accordance with the value stored in said storage circuit (12); and

a power switch (1) for supplying current from a power source (10) to said metering circuit (11) and said storage circuit (12), wherein the improvement comprises:

a first member (3) manually operable from exterior of the camera to actuate said power switch (1), said first member (3) being movable between a first position for opening said power switch and a second position for closing said power switch; and

a second member (16) manually operable from exterior of the camera to actuate said storage switch, said second member (16) being movable between a first position for



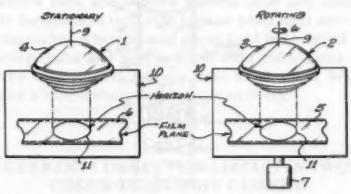
closing said storage switch (14) to electrically connect said metering circuit (11) and said storage circuit (12) and a second position for opening said storage switch (14) to electrically disconnect said metering circuit (11) and said storage circuit (12), the path of movement of said first member (3) and the path of movement of said second member (16) intersecting each other so that said first member (3) when in its first position lies in the path of movement of said second member (16) to prevent said second member (16) from moving from its first position to its second position.

3,934,259

ALL-SKY CAMERA APPARATUS FOR TIME-RESOLVED LIGHTNING PHOTOGRAPHY

Edmund Philip Krider, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 530,882
Int. Cl.² G03B 37/00
U.S. Cl. 354—94 **6 Claims**



1. All-sky camera apparatus for time-resolved lightning photography comprising:

a pair of cameras disposed a spaced distance one from the other in a horizontal plane,

each of said cameras including:

a lens member and

a film member disposed in the focal plane of the lens member; both of said members having an axis of rotation pointed vertically and said lens members both being substantially identical to the extent that both are adapted to view substantially the entire sky for imaging in identical manners lightning discharges occurring in the sky on their respective film member, and

means for rotating the image formed in at least one of said cameras about said common rotational axis, said rotation being at a fixed angular velocity relative to image formed on the film member of said other camera,

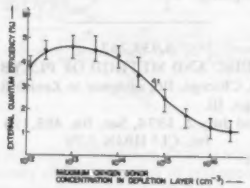
whereby an image of a particular lightning discharge is recorded by both cameras simultaneously for permitting lightning data to be analyzed by measuring the film-recorded angular deviation produced by said relative rotation.

3,934,260

RED LIGHT-EMITTING GALLIUM PHOSPHIDE DEVICE

Akinobu Kasami, Yokohama, and Makoto Naito, Kamakura, both of Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki, Japan

Filed Oct. 10, 1974, Ser. No. 513,821
Claims priority, application Japan, Jan. 29, 1974, 49-11411
Int. Cl.² H01L 33/00, 29/167, 29/207, 29/227
U.S. Cl. 357—17 **2 Claims**



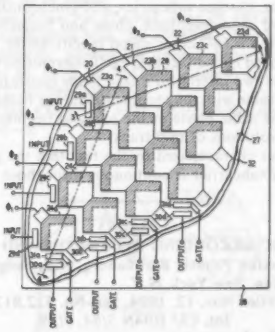
1. A red light-emitting gallium phosphide device wherein the maximum concentration of an oxygen donor in a depletion layer surrounding a p-n junction contributing to the emission of red light is chosen to range from $1 \times 10^{17}cm^{-3}$ to $5 \times 10^{18}cm^{-3}$

3,934,261

TWO-DIMENSIONAL TRANSFER IN CHARGE TRANSFER DEVICES

Carlo Heinrich Sequin, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 357,590, May 7, 1973, abandoned.
This application Feb. 13, 1975, Ser. No. 549,759
Int. Cl.² H01L 29/78
U.S. Cl. 357—24 **7 Claims**



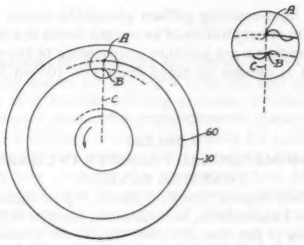
1. A charge transfer device comprising a semiconductor medium which is of a first conductivity type, an insulating layer covering at least a portion of the surface of said medium, a conductive pattern disposed upon said insulating layer comprising a series of conductive strips each formed in the shape of substantially quadrilateral members overlapping in their diagonal dimension placed such that the members form a two-dimensional array of rows and columns of electrodes with

each electrode being coupled along a diagonal dimension in common with all other electrodes in said diagonal dimension to one of a plurality of conduction paths extending over said insulating layer to which a suitable bias may be applied, and means included under a portion of each electrode for forming under each electrode an asymmetric potential well when a suitable bias is applied to said conduction paths, said electrodes being positioned with respect to said means for forming an asymmetric potential well so that said means extends under an area of each electrode bounding two adjacent sides of said electrode so as to define a plurality of parallel transfer paths in said medium in each of two noncollinear directions of movement of mobile charge carriers in a plane essentially parallel to said one surface of said medium, wherein the transfer paths in one direction are formed under the rows of said electrodes and the transfer paths in the other direction are formed under the columns of said electrodes and wherein for any electrode, an adjacent electrode in the row and an adjacent electrode in the column are coupled to different ones of said conduction paths.

3,934,262
VIDEO DISC AND METHOD OF PLAYBACK

Paul A. Snopko, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 2, 1974, Ser. No. 485,194
Int. Cl.² H04N *5/76*
U.S. Cl. 358—4 **5 Claims**



1. A video disc having a multi-turn spiral track in which is stored an angle-velocity-modulated carrier signal modulated by luminance, chroma subcarrier, and synchronizing information arranged as to amplitude, phase and frequency in accordance with the NTSC color signal specifications,

characterized by the fact that each convolution of said track contains two interlaced image fields constituting a single image frame with the chroma subcarrier being of substantially the same phase at the end and beginning points of all convolutions of said track,

and further characterized by the fact that the phase of the chroma subcarrier is continuous throughout the track.

3,934,263
VIDEO DISC RECORDING APPARATUS AND METHODS

Richard Claxton Palmer, Blawenburg, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,812
Int. Cl.² H04N *5/84, 9/38*
U.S. Cl. 358—4 **12 Claims**

1. In a video disc recording system, the combination comprising:

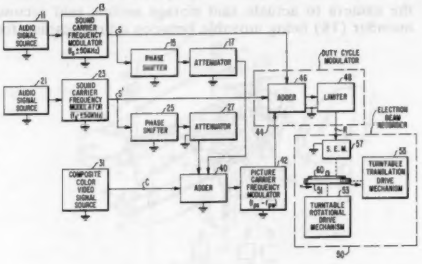
a source of composite video signals;

a source of audio signals;

means for modulating the frequency of a first carrier over a predetermined low frequency deviation range in accordance with the amplitude of audio signals from said audio signal source;

means for adding a frequency modulated carrier wave output of said first carrier modulating means to composite video signals from said composite video signal source;

means for modulating the frequency of a second carrier over a predetermined high frequency deviation range in accordance with the amplitude of the output of said adding means;



means for linearly combining a frequency modulated carrier wave output of said first carrier modulating means with a frequency modulated carrier wave output of said second carrier modulating means to form a combination signal;

clipping means responsive to said combination signal formed by said combining means for developing a clipped signal output; and

disc recording means for utilizing said clipped signal output of said clipping means as a recording signal

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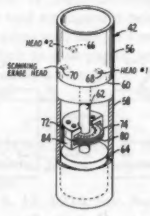
3,934,264
VIDEOTAPE RECORDER AND REPRODUCER EVERY LINE VELOCITY COMPENSATOR APPARATUS

Bert H. Dann, Los Altos, and Barrett E. Guisinger, Saratoga, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 439,093, Feb. 4, 1974. This application Mar. 15, 1974, Ser. No. 451,491
Int. Cl.² H04N *5/76*
U.S. Cl. 358—8 **10 Claims**



1. In a video tape recorder adapted for reproducing a recorded composite color video signal, said video tape recorder including a rotating head assembly having a plurality of video heads, adjacent heads reproducing at least a one horizontal sync pulse overlap of composite video information, said recorder reproducing an uncorrected composite color video signal having line-to-line velocity errors and time base errors, the combination comprising

error detector means continuously receiving the outputs of all said video heads for generating a plurality of error signals, one error signal for each video head corresponding to changes in phase of said uncorrected reproduced video signal from each video head in succeeding horizontal video lines,

means receiving said error signals for selecting one of said error signals as the error signal output, and

means receiving said error signal output for generating a ramp signal output proportional to said error signal.

3,934,265

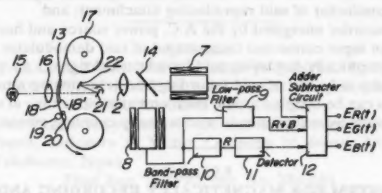
DITUBE TYPE COLOR TELEVISION CAMERA AND ITS APPLICATION TO AN APPARATUS FOR CONVERTING A COLOR FILM PICTURE IMAGE INTO A VIDEO SIGNAL

Syunpei Tanaka, Tama; Kozo Nakamizo, Sagamihara, and Akira Tamagawa, Fuchu, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,790

Int. Cl.² H04N 9/07

U.S. Cl. 358—43 5 Claims



1. A ditube type color television camera in which the light emitted from an object to be reproduced is separated into a light for a brightness signal and a light for a chrominance signal and which comprises a first camera tube adapted to accept the light for said brightness signal and a second camera tube adapted to accept the light for said chrominance signal, whereby said brightness signal and chrominance signal are obtained from said first and second camera tubes, respectively, said camera comprising a striped filter arranged near said object to be reproduced and including a striped filter element for screening blue or red color light only and a striped filter element for passing all visible lights, both said striped filter elements being arranged alternately side by side and assembled into one integral body such that the horizontal scanning direction of said second camera tube is perpendicular to the lengthwise direction of both the respective striped filter elements, and a dichroic mirror arranged between said first camera tube and second camera tube and adapted to separate the incident light into a green color light and red and blue color lights, whereby said green light is accepted by said first camera tube and said red and blue color lights are accepted by said second camera tube to obtain a brightness signal and a chrominance signal, respectively.

3,934,266

DARK CURRENT CORRECTION CIRCUIT IN TWO-TUBE COLOR TELEVISION CAMERA

Takashi Shinozaki, Yokohama, and Seigo Kokufukata, Tokyo, both of Japan, assignors to Victor Company of Japan, Limited, Yohohama, Japan

Filed Dec. 26, 1974, Ser. No. 536,654

Claims priority, application Japan, Dec. 28, 1973, 49-133

Int. Cl.² H04N 9/07

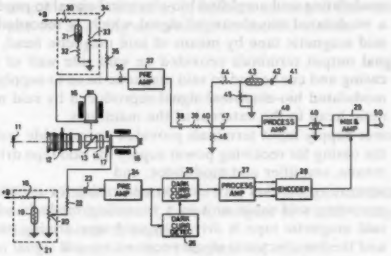
U.S. Cl. 358—44 5 Claims

1. In a two-tube color television camera having a first camera tube for chrominance signals and a second camera tube for luminance signals respectively producing chrominance and luminance signals as picked-up outputs upon receiving respective divided portions of incident light from an object to be image-picked up, a dark current correction circuit comprising:

a detection circuit provided in an output picked-up signal system of said first camera tube and operating to detect a dark current component from said output picked-up signal;

a compensation circuit provided in said output pickup signal system and operating to correct said dark current component in accordance with an output signal of said detection circuit;

a mixing circuit provided in an output picked-up luminance signal system of said second camera tube and operating to apply to said output picked-up luminance signal a horizontal blanking signal with inverse polarity and to mix the two signals; and



a first heat-sensitive resistance element which is provided in the vicinity of the face plate of said second camera tube and connected to a signal system for applying said horizontal blanking signal and operates to vary the resistance value thereof in accordance with temperature variation of the image pickup surface of said second camera tube and to vary the level of said horizontal blanking signal,

said first heat-sensitive resistance element being so adapted and connected as to operate in accordance with the resistance variation thereof to correct the dark current variation component in accordance with said temperature variation and to fix the black level of said output picked-up luminance signal.

3,934,267

VITAL PHENOMENON RECORDING AND/OR REPRODUCING DEVICE

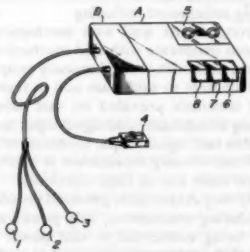
Shinya Kosaka, No. 1261, Wada, Tama, Tokyo; Kenji Furuta, and Akira Nakayama, both of No. 1847-1, Ohwada, Hachioji, Tokyo, all of Japan

Continuation of Ser. No. 374,955, June 29, 1973, abandoned. This application Mar. 26, 1975, Ser. No. 562,335

Claims priority, application Japan, June 30, 1972, 47-65753; June 30, 1972, 47-77424[U]; July 7, 1972, 47-67561; July 7, 1972, 47-79698[U]

Int. Cl.² G11B 5/04, 1/00; A61B 5/04

U.S. Cl. 360—6 15 Claims



1. An apparatus for recording and reproducing a bio-electrical signal produced by a living body comprises

a main unit including
a casing having a portion for accommodating a magnetic tape and a side wall with mechanically coupling means,
a recording and reproducing magnetic head,
means for driving said magnetic tape through said magnetic head,
signal input terminals provided on said side wall of said casing for receiving said bio-electrical signal to be recorded on said magnetic tape,
an amplifier connected to said signal input terminals for amplifying said bio-electrical signal,
a modulator connected to an output of said amplifier for modulating said amplified bio-electrical signal to produce a modulated bio-electrical signal which is recorded on said magnetic tape by means of said magnetic head,
signal output terminals provided on said side wall of said casing and connected to said magnetic head to supply the modulated bio-electrical signal reproduced by said magnetic head to the external of the main unit,
power supply input terminals provided on said side wall of the casing for receiving power supply for said tape driving means, amplifier and modulator, and
an operating member provided on said casing for selectively operating said main unit in a recording mode in which said magnetic tape is driven by said tape driving means and the bio-electrical signal received by said signal input terminals is amplified and modulated and then the modulated bio-electrical signal is recorded on said travelling magnetic tape by said magnetic head and in a reproducing mode in which said magnetic tape is driven by said tape driving means and the modulated bio-electrical signal is reproduced from said travelling magnetic tape by means of said magnetic head and the reproduced signal is supplied to said signal output terminals;
a recording attachement including
a casing having a side wall with mechanically coupling means which cooperate with said mechanically coupling means of said main unit to mechanically couple said recording attachment to said main unit at their side walls,
battery means installed in said casing,
signal output terminals provided on sakd side wall of the recording attachment, said signal output terminals being connected to said signal input terminals of said main unit when said recording attachment is mechanically coupled to said main unit at their side walls,
power supply output terminals provided on said side wall of said casing of the recording attachment and connected to said battery means, said power supply output terminals being connected to said power supply input terminals of said main unit when said recording attachment is mechanically coupled to said main unit at their side walls, and
a detector for detecting said bio-electrical signal from the living body and connected to said casing of the recording attachment through an electrical conductor which is further connected to said signal output terminals of the recording attachment;
a reproducing attachment including
a casing having a side wall with mechanically coupling means which cooperate with said mechanically coupling means of the main unit to mechanically couple said reproducing attachment to said main unit at their side walls,
signal input terminals provided on said side wall of the reproducing attachment, said signal input terminals being connected to said signal output terminals of the main unit when said reproducing attachment is mechanically coupled to said main unit at their side walls,
power supply output terminals provided on said side wall of the reproducing attachment, said power supply output terminals being connected to said power supply input terminals of the main unit when said reproducing attachment is mechanically coupled to said main unit at their side walls,
an amplifier having an input connected to said signal input terminals of the reproducing attachment for amplifying the modulated bio-electrical signal reproduced by said magnetic head of said main unit;
a power supply input conductor connected to said power supply output terminals of the reproducing attachment; and
a signal output conductor connected to an output of said amplifier of the reproducing attachment for supplying the modulated bio-electrical signal to the external of the reproducing attachment;
a demodulator energized by an A.C. power source and having an input connected to said signal output conductor of said reproducing attachment for demodulating said modulated bio-electrical signal to produce a demodulated bio-electrical signal which has the same waveform as the bio-electrical signal detected by said detector of said recording attachment;
a D.C. power source connected to said power supply input conductor of said reproducing attachment; and
a recorder energized by the A.C. power source and having an input connected to an output of said demodulator for graphically displaying said bio-electrical signal;
whereby only one of said recording and reproducing attachments can be coupled to said main unit at any one time at said side walls by means of said mechanically coupling means.

3,934,268

SYSTEM FOR MAGNETICALLY RECORDING AND REPRODUCING STILL VIDEO PICTURES AND AUDIO INFORMATION

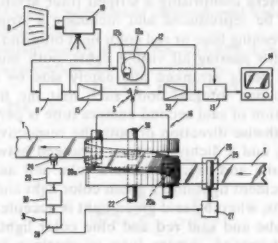
Saburo Uemura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 31, 1968, Ser. No. 749,018

Claims priority, application Japan, Aug. 2, 1967, 42-49667; Aug. 2, 1967, 42-49668

Int. Cl.[2] G11B 21/02

U.S. Cl. 360—101 **2 Claims**



1. In a magnetic recording and reproducing system, a magnetic recording tape guided for movement in a predetermined path; means for effecting the controlled movement of said tape in said path so as to dispose a selected portion of the tape at rest at a recording and reproducing station adjacent said path, said path including a section at said station where said tape is wrapped at least partly around a cylindrical guide surface at an angle normal to planes normal to the axis of said surface; two video signal magnetic heads mounted at said station diametrically opposed to each other and spaced from each other in the direction of said axis; means imparting cyclical rotary movement to said heads to move said heads in first and second planes normal to said axis and across said path to scan repeatedly first and second elongated areas that extend obliquely across said selected portion of the tape while the latter is at rest; means to operate said heads for selectively recording and reproducing video signals in said elongated areas of the tape which are scanned thereby, first and second audio signal magnetic heads mounted at said station diametrically opposed to each other and axially spaced from each other and from said two video signal magnetic heads in the

direction of said axis; means operative when the tape is at rest to impart cyclical rotary movements to move said audio signal magnetic heads in respective third and fourth planes parallel to said first and second planes so as to scan third and fourth elongated areas of said selected portion which are parallel to, substantially of the same length as, and spaced from the first and second elongated areas; means to operate said audio signal magnetic heads for selectively recording and reproducing audio signals in the third and fourth elongated areas scanned thereby; and means synchronizing said cyclical movements of said audio signal magnetic heads at a speed of which the speed of said cyclical movements of the video signal magnetic heads is a whole multiple, whereby during each revolution of said audio signal heads the latter scan said third and fourth elongated areas of said selected portion of the tape while said video signal magnetic heads repeatedly traverse said first and second elongated areas of said selected portion of the tape scanned thereby.

3,934,269

APPARATUS FOR CONTROLLING THE ROTATION OF A ROTATING BODY IN A RECORDING AND/OR REPRODUCING APPARATUS

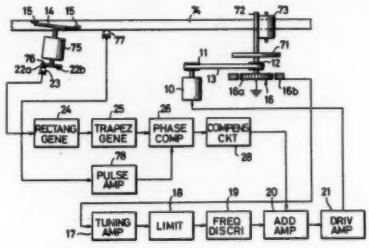
Mitsuo Fujita, Tokyo, and Naoaki Sakaki, Murayama, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 1, 1973, Ser. No. 384,681

Claims priority, application Japan, Aug. 3, 1972, 47-77814; Oct. 11, 1972, 47-101145; Jan. 26, 1973, 48-10887; Jan. 27, 1973, 48-10692

Int. Cl.[2] G11B *21/04, 21/02*

U.S. Cl. 360—70 **11 Claims**



1. An apparatus for controlling the rotation of a rotating body in a recording and/or reproducing apparatus comprising:

a DC motor for driving said rotating body;

a first detecting means for detecting the rotational speed of said body as it is rotated by said DC motor, and for producing interrelatedly with the rotation of the body, an electrical signal of a frequency n_1 times (wherein $n_1 >> 1$) said rotational speed;

first error signal forming means for producing a first error signal having a magnitude which corresponds to the advance or lag in the phase of the output of said first detecting device as compared to the phase of a standard reference signal;

second detecting means for detecting a signal associated with the rotational phase of said rotating body;

second error signal forming means for producing a second error signal by comparing the phase of the output signal of said second detecting means with the phase of a reference signal;

control signal forming means for producing a control signal by combining said first and second error signals;

means for controlling the rotation of said DC motor responsive to the control signal from said control signal forming means;

said rotation controlling means for the DC motor comprising:

a circuit means for generating an AC signal having a constant period and a constant amplitude,

a circuit means for superposing said AC signal from said AC signal generating circuit and a control signal from said control signal forming means for slicing said superposed signal at a specific level,

a driving amplification circuit means for carrying out an on-off switching operation in response to the signal thus sliced and for producing an output rectangular wave, and

a circuit means for smoothing the output of said driving amplification circuit to produce a smoothed DC voltage and for applying said voltage to the DC motor.

3,934,270

TWO-MOTOR CASSETT TYPE TAPE RECORDER

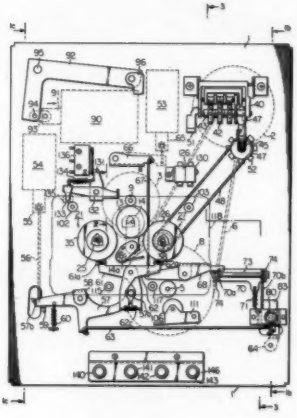
Mitsuo Iwata, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Nov. 8, 1973, Ser. No. 413,942

Claims priority, application Japan, Nov. 10, 1972, 47-112767; May 8, 1973, 48-50275; May 10, 1973, 48-51926; May 10, 1973, 48-51927; May 14, 1973, 48-53376

Int. Cl. G11b *15/32, 23/04, 19/26*

U.S. Cl. 360—96 **7 Claims**



1. A tape recording-reproducing apparatus, comprising:

a chassis receptive of a cassette having a tape for recording signals thereon and reproducing the signals;

a capstan rotatably mounted on said chassis; a motor on said chassis for driving said capstan at a constant peripheral speed for the recording and reproducing of signals;

a pinch roller movable between an active position in which the roller is in frictional engagement with the tape on the periphery of the capstan and an inactive position wherein the roller is withdrawn from the tape;

first clutch wheel means for driving a first tape wheel of the cassette to rewind the tape;

second and third clutch wheel means coaxially arranged for driving an second tape reel in the cassette to wind the tape in forward direction at different speeds;

an idler wheel mounted on said chassis and movable between a first active position in which said idler wheel is in frictional engagement with the periphery of said first clutch wheel means, a second active position in which said idler wheel is in frictional engagement with the periphery of said second clutch wheel means, and a third active position in which said idler wheel is in frictional engagement with periphery of said third clutch wheel means;

reversable motor means having a driving shaft in frictional driving engagement with the periphery of said idler wheel for moving that wheel in said first active position and, at different speeds, in said second and third active positions;

means for axially moving said idler wheel between said second and third active position; and

transducing means for the recording and reproducing of signals on the tape; whereby said reversable motor means and said motor for driving said capstan are enabled to drive the apparatus for rewinding the tape by said first tape reel and for playing and fast forward moving of the tape by said second tape reel.

DESIGN PATENTS

GRANTED JANUARY 20, 1976

ERRATA

For CLASS	See PATENT NO.
083–012.A	238,456

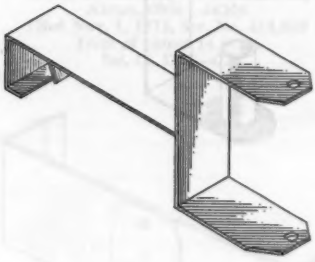
DESIGNS

JANUARY 20, 1976

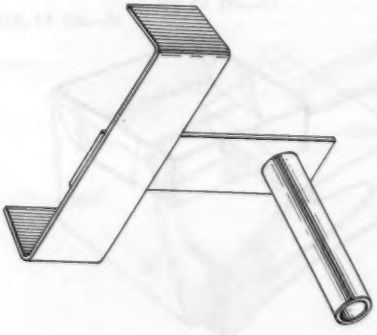
238,457
DISPLAY STAND FOR EYEGLASSES OR THE LIKE
Jay L. Blomquist, 306 Busse Highway, Park Ridge, Ill. 60667
Filed July 16, 1973, Ser. No. 379,793
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

238,458
ARMCHAIR
Mario Cavallero Adrian, Rda. Gral. Mitre 126, Barcelona, Spain
Filed June 6, 1974, Ser. No. 476,842
Claims priority, application Spain Dec. 10, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

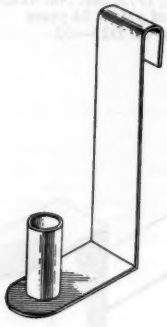
238,459
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,901
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



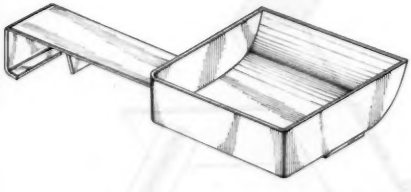
238,460
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,902
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



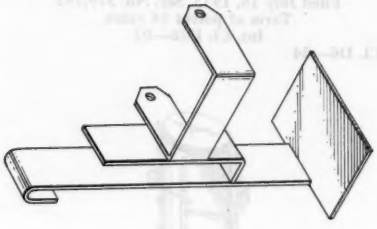
238,461
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,903
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



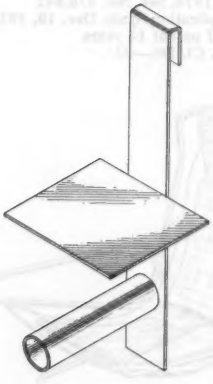
238,462
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,904
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



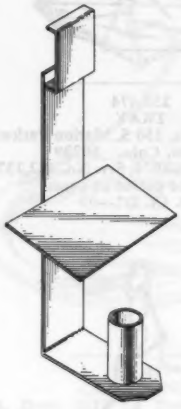
238,463
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,905
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



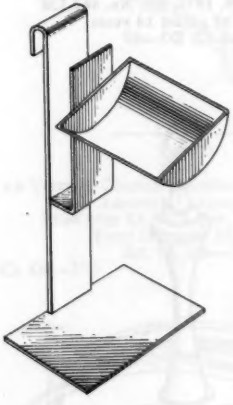
238,464
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,906
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



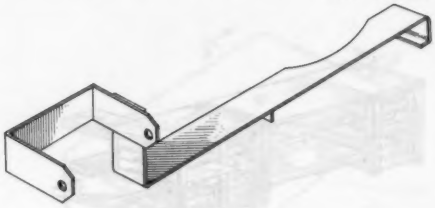
238,465
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,907
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



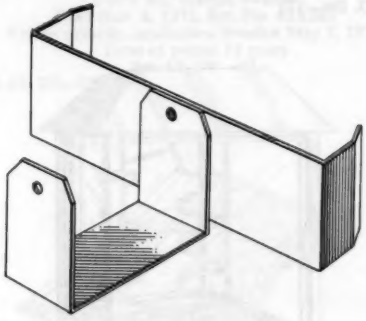
238,466
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,908
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



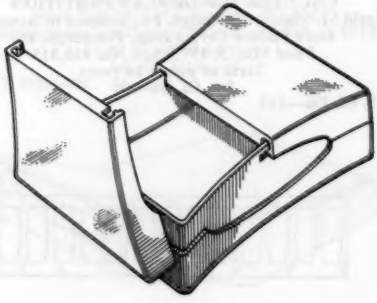
238,467
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,909
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



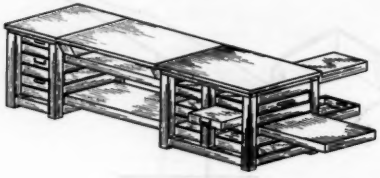
238,468
TOILET TISSUE HOLDER
Arthur E. Bauman, 764 Johnston St., Akron, Ohio 44306
Filed Nov. 1, 1973, Ser. No. 411,910
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



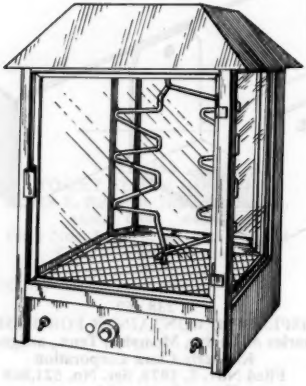
238,469
DISPENSING CONTAINER FOR TISSUES
Charles A. Lanius, Memphis, Tenn., assignor to Kimberly-Clark Corporation
Filed Nov. 7, 1974, Ser. No. 521,868
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—98



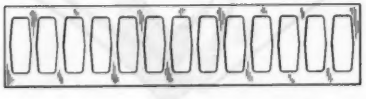
238,470
WORKBENCH
Kenneth H. Petersen, 821 Index Court NE., Renton, Wash. 98055
Original design application Nov. 24, 1971, Ser. No. 202,059, now Patent No. 232,610. Divided and this application Mar. 4, 1974, Ser. No. 447,999
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



238,471
FOOD DISPLAY OVEN
Ronald R. Roderick, Evergreen, Colo., assignor to National Equipment Corporation, Denver, Colo.
Filed Jan. 18, 1974, Ser. No. 434,446
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172

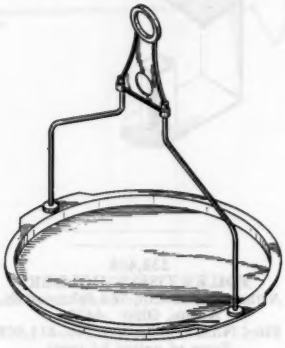


238,472
COUNTER TOP DISPLAY PARTITION
David M. Moore, Pittsburgh, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.
Filed Mar. 5, 1973, Ser. No. 338,315
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193



238,473
COVERED FOOD DISH
William Finnegan, 7200 Beverly Blvd., Los Angeles, Calif. 91203
Filed July 22, 1974, Ser. No. 490,912
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5

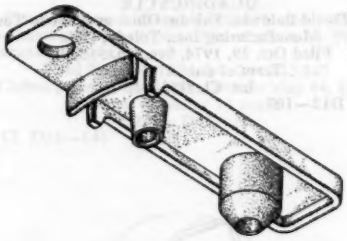
238,474
TRAY
Leland H. Logue, 150 S. Marion Parkway, Denver, Colo. 80209
Filed Apr. 19, 1974, Ser. No. 462,237
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—20



238,475
TRAY
Leland H. Logue, 150 S. Marion Parkway, Denver, Colo. 80209
Filed Apr. 19, 1974, Ser. No. 462,238
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—20

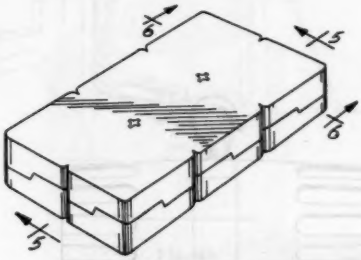
238,476
TRAY
Leland H. Logue, 150 S. Marion Parkway, Denver, Colo. 80209
Filed Apr. 19, 1974, Ser. No. 462,261
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—20

238,477
CAN OPENER
Charles H. Dow, 3125 La Travesia, Fullerton, Calif. 92635; Harold E. Johnson, P.O. Box 704, Rte. 1, Parker, Ariz. 85344; and Clement D. Shaw, Jr., 1166 Steele Drive, Brea, Calif. 92631
Filed Aug. 22, 1974, Ser. No. 499,500
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—40



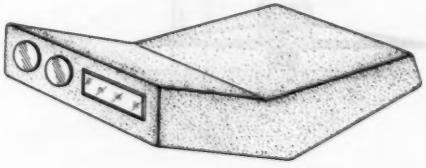
238,478
PULL
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation
Filed May 13, 1974, Ser. No. 469,395
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—173

238,479
SHIPPING CONTAINER FOR BOTTLES OR THE LIKE
Maureen L. Swanson, 6706 Hartman, Omaha, Nebr. 68104
Filed Jan. 24, 1974, Ser. No. 436,347
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

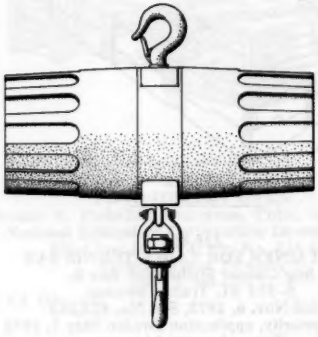


238,480
CONTAINER FOR TABLE-TENNIS BAT
Stig Gunnar Hjelmquist, Box 6, S–573 01, Tranas, Sweden
Filed Nov. 6, 1973, Ser. No. 413,263
Claims priority, application Sweden May 7, 1973
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—192

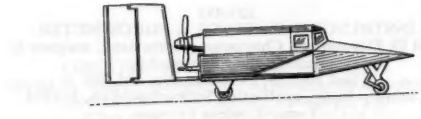
238,481
INSTRUMENT CASE FOR A POROSIMETER
Joel D. Ducommun, Chavannes, Switzerland, assignor to Baumgartner Papiers S.A.
Filed July 25, 1974, Ser. No. 491,924
Claims priority, application Switzerland Feb. 1, 1974
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

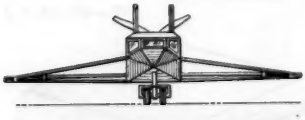


238,482
POWER WINCH
Dallas L. Pitts, Wynne, Ark., assignor to Pitts Drive, Inc., Wynne, Ark.
Filed Apr. 17, 1974, Ser. No. 461,616
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54

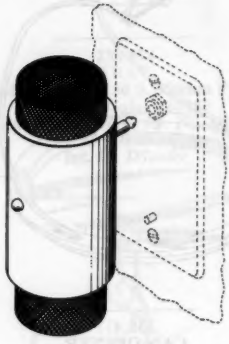


238,483
AIRPLANE
Donald R. Swanson, 1880 Parkside Drive, Concord, Calif. 94520
Filed Oct. 15, 1974, Ser. No. 514,772
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78



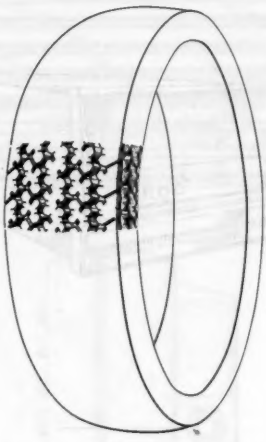


238,484
PLUG-IN DETECTOR UNIT FOR SMOKE AND FIRE DETECTION SYSTEMS
Roy R. Ludt II, 731 S. Chapel Ave., Alhambra, Calif. 91801
Filed Jan. 16, 1974, Ser. No. 433,683
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106

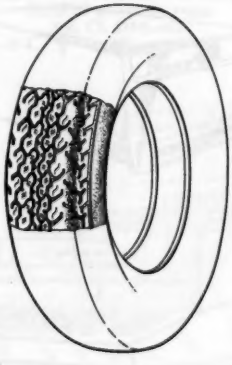


238,485
QUADRICYCLE
Charles David Baldwin, Toledo, Ohio, assignor to Toucon Manufacturing Inc., Toledo, Ohio
Filed Oct. 29, 1974, Ser. No. 518,482
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—107

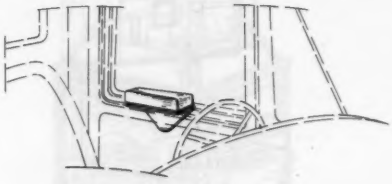
238,486
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerassimos C. Candiliotis, Agawam, Mass., assignor to Uniroyal, Inc.
Filed Feb. 24, 1975, Ser. No. 552,512
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



238,487
TIRE
Jean-Claude Romand, Bourg-la-Reine, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes
Filed Nov. 14, 1974, Ser. No. 523,847
Claims priority, application France May 14, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



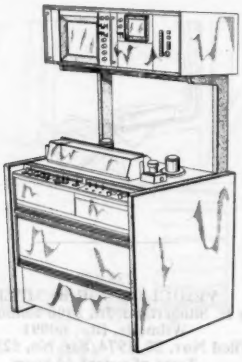
238,488
VEHICLE ARM REST
George W. Vinson, 2022 Windsor, Pekin, Ill. 61554
Filed Feb. 11, 1974, Ser. No. 441,113
Term of patent 14 years
Int. Cl. D6—*99;* D12—*16*
U.S. Cl. D12—155



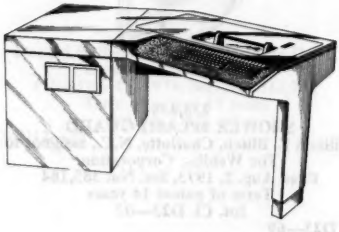
238,489
VEHICLE DOOR BUMPER
Henry H. Slingerland, Jr., 2800 Ramona Court, Wilmette, Ill. 60091
Filed Nov. 20, 1974, Ser. No. 525,629
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—167

238,490
SHOWER SPLASH GUARD
William E. Blitch, Charlotte, N.C., assignor to The Webline Corporation
Filed Aug. 2, 1973, Ser. No. 385,184
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

238,491
MAGNETIC TAPE TRANSPORT
Darrell S. Staley, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Jan. 2, 1974, Ser. No. 419,904
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

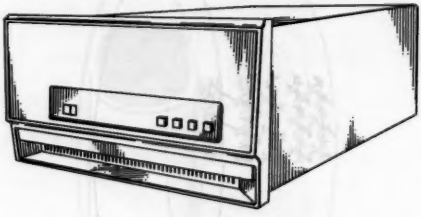


238,492
CONSOLE FOR A DATA SYSTEM
Richard G. Clayton, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Jan. 28, 1974, Ser. No. 437,025
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



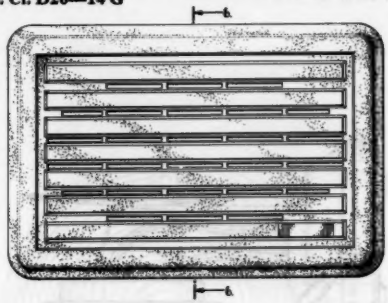
238,493
CALCULATING MACHINE OR SIMILAR ARTICLE
Hisashi Maeda, Nagaokakyo-shi, Japan, assignor to Omron Tateisi Electronics Co.
Filed Mar. 20, 1974, Ser. No. 452,930
Claims priority, application Japan Oct. 11, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

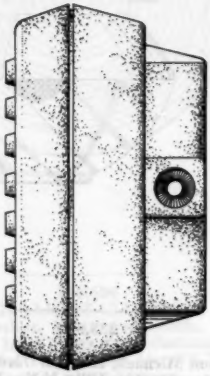
238,494
CONTROL PANEL FOR A DISK FILE
Robert Edward Kalvitis and Donald Agnew Robertson, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed July 29, 1974, Ser. No. 492,387
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



238,495
DISK MEMORY MODULE FRONT PANEL
Robert Edward Kalvitis and Donald Agnew Robertson, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed July 29, 1974, Ser. No. 492,388
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

238,496
AUDIO SPEAKER
Gene T. Brown, Orlando, and Paul M. Bordas, Apoka, Fla., assignors to Scope Incorporated, Reston, Va.
Filed May 22, 1974, Ser. No. 472,114
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G





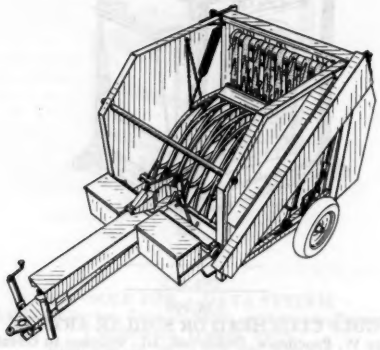
238,497
CABINET FOR AN INPUT-OUTPUT DEVICE FOR A DATA HANDLING SYSTEM
Gregory Fossella, Marshfield, Mass., and John R. Bittner and Kenneth C. McCartney, Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.
Filed Jan. 2, 1974, Ser. No. 430,024
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

238,498
PET HOUSE
Katie H. Barr, 7121 Bull Run Post Office Road, Centerville, Va. 22020
Filed Apr. 22, 1974, Ser. No. 462,726
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

238,499
GOLF CLUB HEAD OR SIMILAR ARTICLE
Lee W. Prochnow, Oakbrook, Ill., assignor to Great American Resources Inc., Elmhurst, Ill.
Filed Mar. 13, 1974, Ser. No. 450,811
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

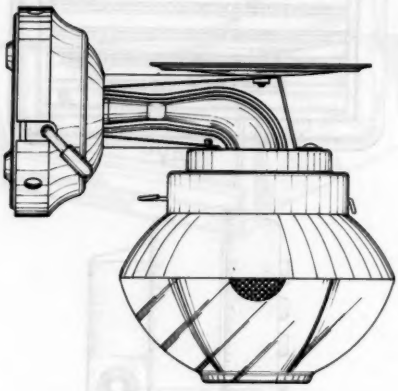
238,500
SKATE COASTER
Robert A. Candler, 2911 De La Vina St., Santa Barbara, Calif. 93105
Filed Aug. 23, 1974, Ser. No. 499,836
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

238,501
ROUND BALE FORMING MACHINE
Melvin Victor Gaeddert, Newton, and Bobby Dwayne McWhirt, Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed Oct. 4. 1974, Ser. No. 511,733
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



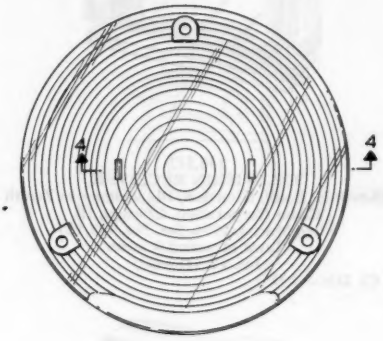
238,502
HOLDER FOR ARTICLES SUCH AS CANDLES, CANDY OR SIMILAR ARTICLES
James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Oct. 23, 1973, Ser. No. 408,371
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

238,503
GAS LIGHT
Stanley M. Loveless, Kalamazoo, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.
Filed June 17, 1974, Ser. No. 479,779
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B

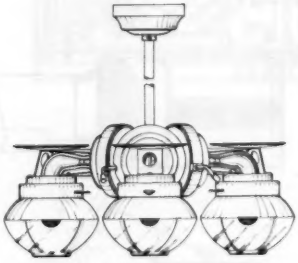


238,504
BASE
Amnon Michaeli, 135—03 73rd Terrace, Kew Gardens Hills, N.Y. 11415
Filed Sept. 16, 1974, Ser. No. 506,409
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 J

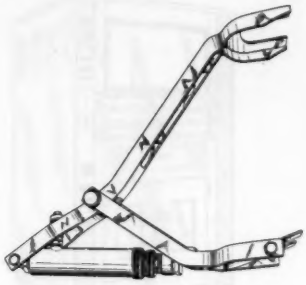
238,505
SIGNAL LAMP LENS
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Nov. 29, 1974, Ser. No. 528,165
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D48—32 A



238,506
GAS LIGHT CLUSTER
Stanley M. Loveless, Kalamazoo, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.
Filed June 17, 1974, Ser. No. 479,780
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



238,507
HYDRAULICALLY DRIVEN TOOL FOR COMPRESSING HELICAL SPRINGS
Kaare Heen, 7 Knausveien, 3100 Tonsberg, Norway
Filed Dec. 6, 1974, Ser. No. 530,474
Claims priority, application Norway June 10, 1974
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—13 R



238,508
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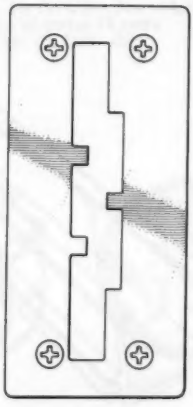
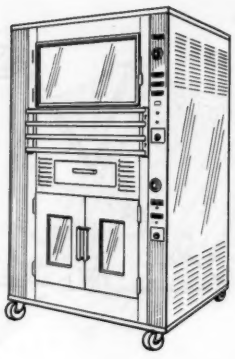
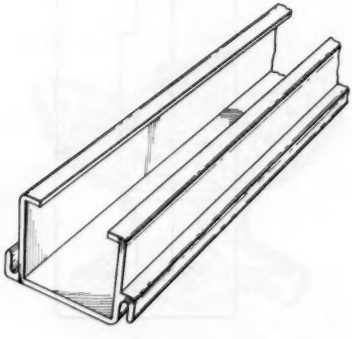
Peter D. Adams, La Canada, and Warner R. Lauper, San Pedro, Calif.; said Lauper assignor to Quadrastat Controls Corporation
Filed Apr. 19, 1974, Ser. No. 462,228
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D55—1 G



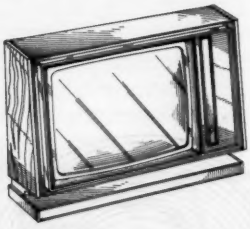
238,509
DISPLAY OVEN
Robert G. Wilson, 10 Chisolm Trail, Greenville, S.C. 29607
Filed July 12, 1974, Ser. No. 488,024
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D55—1 E



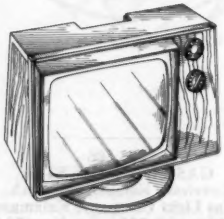
238,510
SUPPORT RAIL FOR ROLLERS OF A GRAVITY CONVEYOR
Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio
Filed Mar. 10, 1975, Ser. No. 556,950
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C



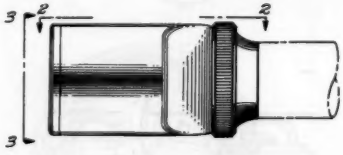
238,511
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Oct. 2, 1973, Ser. No. 402,875
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D

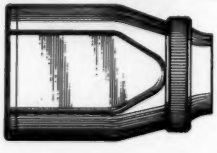


238,512
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Mar. 4, 1974, Ser. No. 448,137
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D

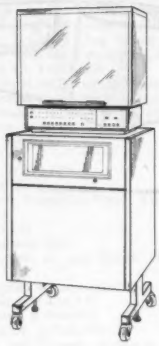


238,513
OCULAR ASSEMBLY FOR A RIFLESCOPE
Gerrit A. Van Exel, Fullerton, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed June 6, 1974, Ser. No. 476,768
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E

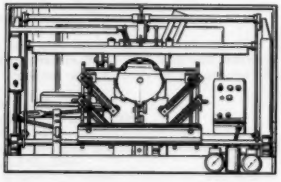


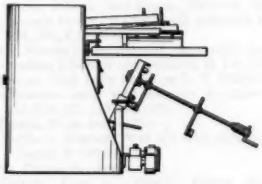


238,514
COMPUTER OUTPUT MICROFILMER
Maurice H. Artaud, Spring Valley, Calif., assignor to Stromberg-DatagraphiX, Inc., San Diego, Calif.
Filed May 23, 1974, Ser. No. 472,573
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



238,515
SILK SCREEN PRINTING MACHINE
Eugene Landesman, University City, Mo., assignor to Lawson Printing Machine Co., Inc., St. Louis, Mo.
Filed Apr. 25, 1974, Ser. No. 464,048
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



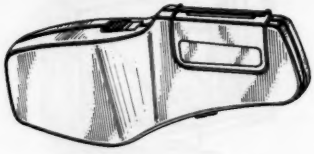


238,516
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Original design application Aug. 22, 1972, Ser. No. 282,659, now Patent No. 233,175. Divided and this application Ju.y 26, 1974, Ser. No. 492,355
Claims priority, application Germany Feb. 25, 1972; Mar. 10, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

238,517
IMPLANTABLE MEDICAL-ELECTRONIC CARDIAC PACER UNIT
Howard J. Thompson, New Richmond, Wis., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Apr. 26, 1974, Ser. No. 464,487
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 F

238,518
PLASTIC SHEET MATERIAL
Thomas C. Hendrickson, South River, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed June 10, 1974, Ser. No. 477,607
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G

238,519
HAIR CLIPPER
Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 11, 1974, Ser. No. 441,674
Claims priority, application Netherlands Aug. 29, 1973
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



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Adams, Thomas F.; Janisch, Douglas W.; and Sirois, William L., to Adams, Thomas F.; Janisch, Douglas W.; and Sirois, William L. Unitary propelling and steering assembly for a power boat. 3,933,116, Cl. 115-35.000.

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Bobeck, Andrew Henry; Kish, Donald Eugene; and Kowalchuk, Roman, to Bell Telephone Laboratories, Incorporated. Reactive coupled drive circuit for magnetic bubble memories. 3,934,235, Cl. 340-174.0TF.
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Bock, Heinz-Wilhelm: *See—*
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Bockstahler, Earl R., to Dow Chemical Company, The. Substituted phenylthioamidines. 3,933,912, Cl. 260-564.00G.
Boehringer Ingelheim GmbH: *See—*
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Bogert, Warren D., to International Telephone and Telegraph Corporation. Frequency lock loop employing a gated frequency difference detector having positive, zero and negative threshold detectors. 3,934,205, Cl. 325-346.000.
Boggs, Beryl Aaron: *See—*
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Bohnsack, Gerhard; Geffers, Hans; Kallfass, Herbert; and Radt, Walter, to Bayer Aktiengesellschaft. Process for preventing corrosion and the formation of scale in water circulating system. 3,933,427, Cl. 21-2.70A.
Boise Cascade Corporation: *See—*
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Boisrayon, Gerard M.; Martin, Gilbert M.; and Delfosse, Gabriel M., to Etat Francais. Buoy releasable from a submarine. 3,933,109, Cl. 114-16.500.
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Bokov, Jury Sergeevich; Gurzheev, Valery Nikolaevich; Zakharov, Vladimir Ivanovich; Korsakov, Vladimir Sergeevich; Lavrischev, Vadim Petrovich; Goron, Alla Grigorievna; Glikman, Mark Leonovich; Semenov, Nikolai Nikolaevich; and Matvienko, Viktor Yakovlevich. Method of making coloured photomasks. 3,933,609, Cl. 204-180.00R.
Boles, Charles L.; and Flanigan, Richard J., to Powermatic/Houdaille, Inc. Noise reducing planter cutter head. 3,933,189, Cl. 144-117.00R.
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Bradley, William S.; Lea, James F., Jr.; and Macy, Robert L. Solubilizing and dispensing material. 3,933,308, Cl. 239-10.000.

Brady, G. Vincent; and Campbell, J. Les, to Kelsey-Hayes Company. Combination support frame and security means. 3,932,899, Cl. 4-3.000.

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Brassette, Donald J., to Thomson International Company. Harvesting topper with curved deflectors. 3,932,984, Cl. 56-63.000.

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Briles, Franklin S. High speed riveting system. 3,933,025, Cl. 72-391.000.

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Brodie, Edwin T.; and Seiler, Ronald, to Bandag Incorporated. Stabilization of tread strip during bonding to tire. 3,933,551, Cl. 156-96.000.

Brooks, Bernard W. Resin laminate and method of making. 3,933,964, Cl. 264-171.000.

Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, to BASF Farben & Fasern AG. Opaque polyester copolymer coated articles. 3,933,875, Cl. 428-413.000.

Brossi, Arnold; Guthrie, Robert William; and Kierstead, Richard Wightman, to Hoffmann-La Roche Inc. 9-Acyloxy-5,11-dimethyl-6H-pyrido[4,3-B]carbazoles. 3,933,827, Cl. 260-287.00C.

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Buchel, Karl Heinz; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating nematodes with alkanesulfonic acid 2-bromoethyl esters. 3,934,026, Cl. 424-303.000.

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Burt, Dan L.; Taraci, Richard F.; and Zavion, John E., to Motorola, Inc. Method for forming a deposited silicon dioxide layer on a semiconductor wafer. 3,934,060, Cl. 427-95.000.
Burt, James Vinton, to United States of America, Navy. Photodichroic readout device using circularly polarized light. 3,934,234, Cl. 340-173.0CC.
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Cameron, John M.; and Kennedy, Robert D., to Ford Motor Company. Electrical connector block assembly having overcenter locking. 3,933,406, Cl. 339-91.00R.
Cameron, Robert G.; and Neuberger, Dan, to Eastman Kodak Company. Photographic elements containing color-forming couplers having and inhibiting effect upon the reactivity of competing couplers. 3,933,501, Cl. 96-74.000.
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Chopra, Kuldip S.; Forgeng, William D.; and Pappas, Nicholas J., to Union Carbide Corporation. Grain refining of aluminum. 3,933,476, Cl. 75-68.00R.

Chou, Su Min: *See—*
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Chown, Martin, to International Standard Electric Corporation. Method for joining optical fibre bundles. 3,933,455, Cl. 65-4.000.

Christofer, Donald E.: *See—*
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Clark, Julius. Cutter device for cutting thermoplastic material. 3,933,067, Cl. 83-155.000.

Clark, Oscar M., to General Semiconductor Industries, Inc. Power surge protection system. 3,934,175, Cl. 317-16.000.

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Clean Energy Corporation: *See—*
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Clendenning, John R., to Hazleton Laboratories, Incorporated. Method of detecting living microorganisms. 3,933,592, Cl. 195-103.50R.

Clerk, Robert Cecil. Hydrostatic transmission control system. 3,932,991, Cl. 60-431.000.

Cleveland Hardware and Forging Company: *See—*
Bretz, Frank E., Jr., 3,933,225.

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Clinton, Russell M., III: *See—*
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Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, to Albright & Wilson Limited. Organotin thermal stabilizers for PVC resins. 3,933,743, Cl. 260-45.75J.

Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar H., to Albright & Wilson Limited. Esters and mixtures thereof with organotin compounds useful as polymer stabilizers. 3,933,744, Cl. 260-45.75S.

Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, to Albright & Wilson Limited. Novel stabilized polymer compositions. 3,933,750, Cl. 260-45.75S.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. External register memory chip in a calculator system. 3,934,229, Cl. 340-172.500.

Cohen, Noal, to Hoffmann-La Roche Inc. Synthesis of A-ring aromatic steroids. 3,933,870, Cl. 260-397.500.

Coherent Radiation: *See—*
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Colella, Donald F.; and Kaiser, Carl, to SmithKline Corporation. N,N'-bis[3-substituted-4-hydroxyphenyl)-2-hydroxyethyl)]-polymethylenediamines. 3,933,913, Cl. 260-570.600.

Coleman Company, Inc., The: *See—*
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Coleman, Richard L.: *See—*
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Coles, Carl R. Pressure compensated hermetically sealed transmission system. 3,933,052, Cl. 74-18.100.

Coles, Robert F.; and Skoog, Ivan H., to Minnesota Mining and Manufacturing Company. Organic dye having fluoroaliphatic substituent. 3,933,914, Cl. 260-577.000.

Colgate-Palmolive Company: *See—*
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Collins, Joseph C.; and Diana, Guy D., to Sterling Drug Inc. 3,4-Methylenedioxyphenoxy-alkyl diketones and keto-esters. 3,933,837, Cl. 260-340.500.

Collins, Paul M.: *See—*
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Collins, William O. Fluorescent plastic controlled direction lamp. 3,934,148, Cl. 250-458.000.

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Colvin, Floyd E.; Mummert, John R.; and Gilbert, Franklin George, to Carborundum Company, The. Electrically conducting filter media for fluids. 3,933,643, Cl. 210-243.000.

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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Conboy, Stewart J., to D. W. Zimmerman Mfg. Inc. Interlock control system for a fluid-operated hoist. 3,933,388, Cl. 294-64.00R.

Congleton, Wayne L., to Dolco Packaging Corporation. Insulative packaging device. 3,933,295, Cl. 229-2.500.

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Continental Oil Company: *See—*
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Control Data Corporation: *See—*
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Cook, Leonard J.; and Rosenthal, Herman A., to Rohr Industries, Inc. Aircraft anti-icing plenum. 3,933,327, Cl. 244-134.00B.
Cook, Newell C.; and Davis, Gary C., to General Electric Company. Process for making N-methyl nitrophthalimides. 3,933,852, Cl. 260-326.00N.
Cook, William R., Jr. Source of ultraviolet light employing a laser pumped borate crystal. 3,934,154, Cl. 307-88.300.
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Keck, Donald B.; and Schultz, Peter C., 3,934,061.
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Costes, Didier, to Commissariat a l'Energie Atomique. System for sealing and heat-insulating a duct containing a hot fluid under pressure. 3,933,182, Cl. 138-149.000.
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Counts, W. Ray; and Schickedanz, Wayne M., to Transport Security Systems, Inc. Security lock. 3,933,382, Cl. 292-144.000.
Cowley, Robert L., to Xerox Corporation. Imaging composition for photoelectrophoretic imaging system. 3,933,487, Cl. 96-1.0PE.
Cox, Patrick Clement. Dispenser for expelling contents of collapsible tubes and method of using. 3,933,273, Cl. 222-1.000.
Craig, Coba C.: *See—*
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Craig, Coba C., Jr., to Jenkins, James E.; Moore, Joseph L.; and Craig, Coba C. Ladder leveler. 3,933,222, Cl. 182-204.000.
Cramer, Frank B., to Clean Energy Corporation. Steam generation with coal. 3,933,128, Cl. 122-4.00R.
Craps, Lucien, to Sandoz Ltd., (Sandoz AG). Organic compounds. 3,933,999, Cl. 424-31.000.
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Cricchio, Renato; and Lancini, Giancarlo, to Gruppo Lepetit S.p.A. New 3-formylrifamycin SV derivatives. 3,933,800, Cl. 260-239.30P
Crile, Eugene E.: *See—*
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Crocker, Dorian Dodge: *See—*
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Crocker Nat'l Bank in trust for Dariel Dodge & Betty Dodge Malone: *See—*
Dodge, Adiel Y., deceased; and Crocker, Dorian Dodge, executrix, 3,933,600.
Crooks, Stanley R.; and Fish, Warren H., to Whirlpool Corporation. Structure for mounting air moving means in a vacuum cleaner. 3,932,911, Cl. 15-327.00D.
Cross, Barrington; and Arotin, Robert Louis, to American Cyanamid Company. Ester of (alkynyloxy)-, (alkenyloxy)-, and (cyanoalkoxy) carbanilic acids and their use as herbicides. 3,933,470, Cl. 71-111.000.
Cruckshank, Ira G.; and Snodgrass, Thomas J., to United States Steel Corporation. Method of laminating a plastic sheet onto a surface of a hollow body. 3,933,562, Cl. 156-250.000.
Csatary, Laszlo Kalman; and Pongracz, Frank Istvan. Intra-uterine contraceptive device. 3,933,153, Cl. 128-129.000.
Csicsatka, Antal, to General Electric Company. Four channel stereophonic broadcasting system. 3,934,092, Cl. 179-15.0BT.
Csicsery, Sigmund M., to Chevron Research Company. Fuel injection cold start and evaporative control system using a bimodal adsorbent bed. 3,933,130, Cl. 123-3.000.
Cugini, Edward T., to Grant Oil Tool Company. Removable packer and tesnion slip assembly. 3,933,376, Cl. 285-23.000.
Cunningham, Donald M., to Emerson Electric Co. Temperature conditioning means. 3,933,200, Cl. 165-64.000.
Cunningham, Donald M.; and Santoro, Ralph, to Emerson Electric Co. Electric heater assemblies. 3,934,116, Cl. 219-336.000.
Curley, John L.; and Richard, Roger R., to Honeywell Information Systems, Inc. Interprocessor communication apparatus for a data processing system. 3,934,232, Cl. 340-172.500.
Curtis, Harris L.; and Foley, James W., to Polaroid Corporation. Novel bis-pyrazolone oxonol dyes. 3,933,798, Cl. 260-239.900.
Curtis, Robert Bartlett; and Riedel, Nelson Andrew, to Bell Telephone Laboratories, Incorporated. Telephone message timing system. 3,934,090, Cl. 179-7.10R.
Cuttitta, Louis L.; and Falen, Walter S., to General Motors Corporation. Air valve carburetor. 3,933,950, Cl. 261-50.00A.
CX Corporation: *See—*
Tall, Leonard H.; and Edwards, Gerald L., 3,933,069.
D. W. Zimmerman Mfg. Inc.: *See—*
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Daetz, Otto: *See—*
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Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, to Merck Patent Gesellschaft mit beschrankter Haftung. Azole derivatives. 3,933,840, Cl. 260-307.00R.
Dai Nippon Printing Company Limited: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
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D'Alelio, Gaetano F.; and Kuehn, Erich, to ICI United States Inc. Dihalobutenediol containing urethane foam compositions. 3,933,690, Cl. 260-2.5AM.
Dall'Argine, Gianfranco; and Ghiretti, Ermes. Squeezing-shredding machine for tomato pulp suitable for canning in the raw state. 3,933,084, Cl. 99-538.000.
Damm, David A.; Juvinall, John W.; and Scherf, Gerald F., to Owens-Illinois, Inc. Bird-swing detector. 3,933,248, Cl. 209-74.00M.
Dandini, Alessandro O. Spherical rolling hull marine vessel. 3,933,115, Cl. 115-19.000.
Danfoss A/S: *See—*
Nielsen, Peter Vilhelm, 3,933,306.
Daniels, Robert A. Apparatus and method for disposing of solid human excrement in an engine-driven conveyance. 3,933,636, Cl. 210-71.000.
Dann, Bert H.; and Guisinger, Barrett E., to International Video Corporation. Videotape recorder and reproducer every line velocity compensator apparatus. 3,934,264, Cl. 358-8.000.
Dasek, Jaroslav; and Traelnes, Knut Rude, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for preparing intracellular substances of microbial origin. 3,933,591, Cl. 195-96.000.
Dauge, Jean: *See—*
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Daum, Werner, to Bayer Aktiengesellschaft. Preparation of benzimidazol-2-yl-carbamic acid alkyl esters. 3,933,846, Cl. 260-309.200.
Dautreppe, Bernard; and Lallemang, Michel, to Chisalu. Bottle cap seal. 3,933,266, Cl. 215-316.000.
David Clark Company Incorporated: *See—*
Kaplan, Burton H.; Poole, Forrest R.; and Flagg, John E., 3,933,150.
Davidson, Hugh; Johnson, Keith Trevor; Leggeter, Brian Ernest; and Moore, Anthony John, to Hickson & Welch Limited. 3-Oxadiazolyl coumarins. 3,933,842, Cl. 260-307.00G.
Davies, Philip Henri, deceased; and by Savies, Bessie Snowden, executrix, to Allbook & Hashfield Holdings Limited. Sewing machines. 3,933,107, Cl. 112-256.000.
Davies, Richard Llewelyn, to Lever Brothers Company. Detergent compositions containing polymeric builders. 3,933,673, Cl. 252-135.000.
Davis, Barabara, executrix: *See—*
Wilkinson, Kenneth Edward; Davis, John Howard, deceased; and Harwood, Richard C., executor, 3,933,545.
Davis, Gary C.: *See—*
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Davis, JLee, to Avance Oil & Gas Company, Inc. Method of seismic exploration for penetrating diffraction barriers and/or surveying beneath obstacles. 3,934,220, Cl. 340-15.5MC.
Davis, John Howard, deceased: *See—*
Wilkinson, Kenneth Edward; Davis, John Howard, deceased; and Harwood, Richard C., executor, 3,933,545.
Davis, Rhetta Q.: *See—*
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Day, Ralph K. Window construction. 3,932,971, Cl. 52-171.000.
Dearlove, Thomas J.; Campbell, Gregory A.; and Atkins, Richard P., to General Motors Corporation. Preparation of isocyanate terminated prepolymer. 3,933,725, Cl. 260-33.6UB.
Decoflex Limited: *See—*
Judd, William James, 3,933,304.
Deere & Company: *See—*
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Korbel, Adrian Charles, 3,933,389.
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Deering Milliken Research Corporation: *See—*
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De Feudis, Sergio, to Aktiebolaget Svenska Flaktfabriken. Arrangement at central installations for pneumatic transport of packaged refuse. 3,933,393, Cl. 302-27.000.
Defilippi, Joseph D.; and Ratz, George A., to United States Steel Corporation. Vanadium stabilized martensitic stainless steel. 3,933,479, Cl. 75-128.00V.

Degen, Ludwig: *See—*
Nardi, Dante; Massarani, Elena; and Degen, Ludwig, 3,933,793.

de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Brake having a braking member in the form of a ring, especially for automobile vehicles. 3,933,227, Cl. 188-76.000.

de Latour, Christopher, to Massachusetts Institute of Technology. Method of detection of ions in solution that are susceptible to an applied force field and apparatus therefor. 3,934,192, Cl. 324-34.00R.

Delfosse, Gabriel M.: *See—*
Boisrayon, Gerard M.; Martin, Gilbert M.; and Delfosse, Gabriel M., 3,933,109.

DeLuca, Robert D., to Corning Glass Works. Method of making optical waveguides. 3,933,454, Cl. 65-3.000.

DeLuca, Robert D.: *See—*
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Demarne, Henri, to Clin Midy. Indole derivatives. 3,933,853, Cl. 260-326.150.

Demetrescu, Mihai C. Resonant gas-expansion engine with hydraulic energy conversion. 3,932,989, Cl. 60-327.000.

Dempster, Thomas B., to Hoerner Waldorf Corporation. Loin box with locking cover. 3,933,300, Cl. 229-33.000.

Dendronic Decisions Limited: *See—*
Armstrong, William Ward, 3,934,231.

Denis, Albert P. Welding system and method for arc starting and control. 3,934,110, Cl. 219-131.00F.

Denisova, Tamara Trofimovna: *See—*
Babitsky, Boris Davidovich; Denisova, Tamara Trofimovna; Kormer, Vitaly Abramovich; Lapuk, Irina Moiseevna; Lobach, Mark Iosifovich; Simanova, Nadezhda Pavlovna; Soloviev, Kim Sergeevich; Chepurnaya, Tamara yakovlevna; and Jufa, Tatyana Lvovna, 3,933,777.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,933,754.

Dennison-Eastman Corporation: *See—*
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Dennison, Richard L.: *See—*
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Denslow, Keith R.: *See—*
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Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Isoxazolopyridine ketone derivatives. 3,933,823, Cl. 260-268.0BC.

de Oude, Nicolaas Tieme: *See—*
Bartolotta, Guiseppe; de Oude, Nicolaas Tieme; and Gunkel, Alfred Alexander, 3,933,672.

De Pasquale, Ralph J.; and Baucom, Keith B., to PCR, Inc. Perfluorinated tertiary amines. 3,933,831, Cl. 260-293.510.

Depoorter, Henri; and Schellekens, Jozef Remy, to AGFA-GEVAERT N.V. Spectral sensitization of direct-positive silver halide emulsions. 3,933,506, Cl. 96-101.000.

de Possel, Rene. System for scanning and identifying standardised characters at high speed. 3,934,225, Cl. 340-146.30J.

Depping, Karl Dieter: *See—*
Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 3,933,875.

Desmonds, Daniel J., to Control Data Corporation. Shift network for dual width operands. 3,934,132, Cl. 235-164.000.

DeSoto, Inc.: *See—*
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Sekmakas, Kazys; and Petrovich, Paul, 3,933,760.

Desrosiers, Wilfrid. Animal trap. 3,932,955, Cl. 43-81.000.

De Stoutz, William Patrick. Method and apparatus for the irradiative treatment of beverages. 3,934,042, Cl. 426-248.000.

Deurbrouck, Albert W.: *See—*
Welsh, Robert A.; and Deurbrouck, Albert W., 3,933,249.

Deuterium Corporation: *See—*
Spevack, Jerome S., 3,933,995.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Beschke, Helmut; Offermanns, Heribert; and Schuler, Wilhelm-Alfons, 3,933,813.

Devillers, Julien, to International Trading Company. Control apparatus for a machine for grinding the edges of a workpiece. 3,932,962, Cl. 51-165.720.

De Volder, Noel Jozef: *See—*
Van Engeland, Jozef Leonard; De Volder, Noel Jozef; and Timmerman, Daniel Maurice, 3,933,665.

Dial, Darrell D.: *See—*
von Bose, Robert J.; and Dial, Darrell D., 3,933,111.

Diamond International Corporation: *See—*
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Diamond Shamrock Corporation: *See—*
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Diana, Guy D.: *See—*
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Dickens, Elmer D., Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,933,742, Cl. 260-45.75N.

Dickson, James, to Airco, Inc. Method for recovering a usable alloy from titanium scrap. 3,933,473, Cl. 75-10.00R.

Didot, Francois E.: *See—*
Thompson, Robert M.; and Didot, Francois E., 3,933,663.

Dietzsch, Kurt, to Suddeutsche Kuhlerfabrik, Julius Fr. Behr. Water faucet with slider. 3,933,339, Cl. 251-176.000.

Di Giacomo, Armand; Murphy, Charles Vincent; and Pinkney, Paul Swithin, to Du Pont de Nemours, E. I., and Company. Blends of ethylene/vinyl chloride/vinyl acetate copolymer with nitrocellulose. 3,933,703, Cl. 260-17.00R.

DiGilio, Philip; and Manetta, John. Ring with interchangeable setting. 3,933,011, Cl. 63-29.00R.

Digital Computer Controls, Inc.: *See—*
Worst, Bernard I., 3,934,227.

Dilliplane, James John, to Du Pont de Nemours, E. I., and Company. Clip for shielded multiconductor flat cable. 3,934,075, Cl. 174-75.00R.

Dillon, Oscar W.: *See—*
Spooner, Robert J.; and Dillon, Oscar W., 3,933,066.

DiMatteo, Paul L., to Dynell Electronics Corporation. Method of generating and constructing three-dimensional bodies. 3,932,923, Cl. 29-407.000.

Dines, Martin B., to Exxon Research and Engineering Company. Method for lithiating metal chalcogenides and intercalated products thereof. 3,933,688, Cl. 252-520.000.

Dines, Martin B.: *See—*
Tyler, William E., III; and Dines, Martin B., 3,933,878.

Di Peri, Leonard J. Gas separator for liquid supply. 3,933,448, Cl. 55-159.000.

Disselnkotter, Hans; and Metzger, Karl Georg, to Konig, Hans-Bodo; Schrock, Wilfried; and Bayer Aktiengesellschaft. Ureidoacetamidopenicillins. 3,933,795, Cl. 260-239.100.

Dittrich, Volker: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,933,858.

Dix, James S.: *See—*
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Doall Company: *See—*
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Dobelmann, Jochen, to REPA GmbH Feinstanzwerk. Buckle assembly for motor vehicle safety belts. 3,932,917, Cl. 24-230.00A.

Dobrzanski, John; and Hart, Ernest V., to Emhart Corporation. Ionization smoke detector and alarm system. 3,934,145, Cl. 250-381.000.

Dochterman, Richard W., to General Electric Company. Method of making dynamoelectric machines and assemblies therefor. 3,932,930, Cl. 29-596.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Pries, Erich E., 3,933,598.

Dr. Eugene Durrwachter DODUCO: *See—*
Harmsen, Ulf O.; and Pottken, Wolfgang S., 3,932,935.
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Ham, William C.; Dodd, Francis J.; and Friedrick, Spencer J., 3,933,026.

Dodge, Adiel Y., deceased; and by Crocker, Dorian Dodge, executrix, to Crocker, Dorian Dodge; Dodge, Sherwood, Jr.; Robinson, Dorian Dodge; and Crocker Nat'l Bank in trust for Dariel Dodge & Betty Dodge Malone. Method and apparatus for desalinization of water. 3,933,600, Cl. 203-10.000.

Dodge, Sherwood, Jr.: *See—*
Dodge, Adiel Y., deceased; and Crocker, Dorian Dodge, executrix, 3,933,600.

Dohgane, Iwao: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,933,921.

Dolby Laboratories, Inc.: *See—*
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Dolby, Ray Milton, to Dolby Laboratories, Inc. Signal compressors and expanders. 3,934,190, Cl. 323-8.000.

Dolco Packaging Corporation: *See—*
Congleton, Wayne L., 3,933,295.

Donbee Corporation: *See—*
Mercer, Donald W.; and Horey, Edward C., Jr., 3,933,357.

Donelian, Khatchik O. Hermatically sealed motor blower unit with stator inside hollow armature. 3,933,416, Cl. 417-354.000.

Donohue, James M.; Kramer, Joseph R.; and Rodek, Victor, to Xerox Corporation. Synchronizing apparatus. 3,934,182, Cl. 318-85.000.

Donray Products Company: *See—*
Studen, Charles E., 3,933,571.

Doody, Richard D., to United States of America, Air Force. Tubular regenerator for a cryogenic refrigerator. 3,933,000, Cl. 62-6.000.

Doring, Edward J., to Onondaga Tool Corporation. Shearproof punch. 3,933,071, Cl. 83-637.000.

Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; and Rubsam, Franz, to Bayer Aktiengesellschaft. Sulfuric acid contact process. 3,933,991, Cl. 423-535.000.

Dornak, Henry E., Jr., to Exxon Research and Engineering Company. Marine vessel propulsion system. 3,933,113, Cl. 115-12.00R.

Dorschner, Kenneth P.: *See—*
Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., 3,933,915.

Doser, Manfred; and Floryan, Daniel Edwin, to General Electric Company. Method of making magnets by polymer-coating magnetic powder. 3,933,536, Cl. 148-105.000.

Dotsko, Martin, to Singer Company, The. Method of making optical fiber mounting arrangement. 3,932,926, Cl. 29-447.000.

Dottinger, Konrad, to Busino & Co. Swimsuit. 3,932,896, Cl. 2-67.000.

Dougherty, Edward F.; and Hobbs, Charles C., Jr., to Celanese Corporation. Hexanediol from cyclohexane. 3,933,930, Cl. 260-635.00D.

Douglas, Edward Curtis: *See*—
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Dow Chemical Company, The: *See*—
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Best, John S., 3,932,997.
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Dowbenko, Rostyslaw: *See*—
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Downey, Rogers B., to Polaroid Corporation. Method of manufacturing photographic film unit. 3,933,555, Cl. 156-155.000.
Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. Insecticidal composition and method utilizing phosphoric acid phenylsulphonamide esters. 3,934,010, Cl. 424-211.000.
Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, to Bayer Aktiengesellschaft. N-methyl-imidazole derivatives as anti-mycotic agents. 3,934,014, Cl. 424-251.000.
Dragerwerk Aktiengesellschaft: *See*—
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Drake, George L., Jr.: *See*—
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Dressel, Herman O.: *See*—
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Driscoll, John N., to HNU Systems Inc. Photoionization. 3,933,432, Cl. 23-232.00E.
Dubble, Roger D., to Anchor Hocking Corporation. Flame masking of glass articles for metal oxide film deposition. 3,934,063, Cl. 427-223.000.
Dubin, Robert R.; Will, Fritz G.; and Mowrey, William L., to General Electric Company. Solid sodium ion-conductive electrolyte with liquid metallic layer. 3,933,523, Cl. 136-6.0FS.
Duc, Nguyen-Cong, to Les Produits Organiques du Santerre Orsam. Method of making L-aspartic acid from fumaric acid. 3,933,586, Cl. 195-65.000.
Ducloux, Maurice: *See*—
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Dudley, Kenneth W.; and MacMaster, George H., to Raytheon Company. Solid state solar to microwave energy converter system and apparatus. 3,933,323, Cl. 244-1.00R.
Dudley, Kenneth W.: *See*—
MacMaster, George H.; and Dudley, Kenneth W., 3,934,106.
Dudley, Michael Alan, to Canada Wire and Cable Limited. Apparatus and method for continuous electrocoating. 3,933,611, Cl. 204-181.000.
Dugge, Richard H., to ACF Industries, Incorporated. Hopper gate actuating mechanism. 3,933,100, Cl. 105-282.00P.
Dugger, Cortland O., to United States of America, Air Force. Aluminum nitride single crystal growth from a molten mixture with calcium nitride. 3,933,573, Cl. 156-624.000.
Dulaney, Ernest N.; and Elmhurst, Richard F., to Honeywell Information Systems, Inc. Apparatus for continuous assessment of data transmission accuracy in a communication system. 3,934,224, Cl. 340-146.1BA.
Dulux Australia Limited: *See*—
Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, 3,933,579.
Dungan, Kendrick W.: *See*—
Seidehamel, Richard J.; and Dungan, Kendrick W., 3,933,998.
Dunlop, James. Converter for guitars. 3,933,077, Cl. 84-318.000.
Du Pont de Nemours, E. I., and Company: *See*—
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Aufdermarsh, Carl Albert, Jr., 3,933,677.
Baucom, Everett Ira, 3,933,971.
Briggs, Anglis R.; and Maxwell, Thomas J., 3,932,943.
Contractor, Rashmikant M.; and Hwang, Sang-Hak, 3,932,915.
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Dilliplane, James John, 3,934,075.
Fischer, Leewellyn C.; and Hunt, Heman Dowd, 3,933,498.
Gebhard, John Charles, Jr.; Waggoner, Marion Glen; and Webster, James Lang, 3,933,954.
Hoeschele, Guenther Kurt, 3,933,759.
Long, James D., 3,933,469.
Looney, Catharine Elizabeth, 3,933,423.
Lowthian, Edwin Doll, 3,934,064.
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Durand, Daniel: *See*—
Bailly, Jean Claude; Durand, Daniel; and Mangin, Pierre, 3,933,934.
Duranleau, Roger G.: *See*—
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Durkin, Joseph A.; and Patel, Jitendra A., to Texaco Inc. Desulfurization process. 3,933,623, Cl. 208-216.000.
Durrum Instrument Corporation: *See*—
Hare, Peter Edgar, 3,933,430.
Dutertre, Christian; and Dauge, Jean, to Etablissements Dutertre. X-ray diagnostic apparatus in particular for examining the injured. 3,934,140, Cl. 250-320.000.
Du Vall, Wilbur E.; and Foster, Roger J. Apparatus and method for treating disorders in the region of the pubococcygeous muscle. 3,933,147, Cl. 128-2.00S.
Dworschack, Robert G.; White, William H.; and Chen, James C., to Standard Brands Incorporated. Enzyme treatment. 3,933,588, Cl. 195-68.000.
Dwyer, John Robert, Jr., to Black and Decker Manufacturing Company, The. Manually controlled air inflator adaptor. 3,933,177, Cl. 137-608.000.
Dynamation Enterprises, Inc.: *See*—
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Dynell Electronics Corporation: *See*—
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E. F. Houghton and Company: *See*—
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E M I Limited: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Denzel, Theodor; and Hoehn, Hans, 3,933,823.
Yale, Harry L.; and Bristol, James Arthur, 3,933,836.
Eastin, William C., to Western Dairy Products Division of Chelsea Industries, Inc. Production of dried sodium caseinate with uniform content of tracing compound for use in sausage. 3,934,051, Cl. 426-652.000.
Eastman, David W.; Lemper, Anthony L.; Pattison, Victor A.; Hopkins, George C.; Kahn, Henry; and Nickels, Jack L., to Hooker Chemicals & Plastics Corporation. Composition of and method of obtaining small particle size polymers and copolymers of vinyl chloride having a fused surface. 3,933,771, Cl. 260-87.100.
Eastman Kodak Company: *See*—
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Eaton Corporation: *See*—
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Ebert, Michael: *See*—
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Ebing, Winfried; and Pflugmacher, Jochen. Apparatus for automatically purifying extracts of vegetable and animal specimens for the determination free from interference of traces of selected extract constituents. 3,933,437, Cl. 23-253.00R.
Ebrecht, Dietrich Meyer, to U.S. Philips Corporation. Logarithmic resistance-to-frequency converter. 3,933,046, Cl. 73-362.0AR.
Eccles, Anthony Garth: *See*—
Rodenchuk, William Simon; and Eccles, Anthony Garth, 3,923,192.
Economic Laboratories, Inc.: *See*—
Brill, John B.; Morris, Charles A.; and Moon, Soo-Duck, 3,933,670.
Economy Engine Company, The: *See*—
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Edgar, Hugh T.; and Lovely, John W., to Bryant Grinder Corporation. Single slide grinding machine. 3,932,960, Cl. 51-5.00D.
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Tall, Leonard H.; and Edwards, Gerald L., 3,933,069.
Edwards, Robert B., to Nibco, Inc. Butterfly valve seat mold. 3,933,334, Cl. 249-57.000.
Egger, Hermann, to Quepar S.A. Device for the sterilization of packaging material. 3,933,428, Cl. 21-93.000.
Ehara, Leo; Miwa, Takafumi; and Kamaya, Masami, to Asahi Kasei Kogyo Kabushiki Kaisha. Desalination process by improved multistage electrodialysis. 3,933,610, Cl. 204-180.00P.
Eich, Edmund; Weber, Ewald; Gerner, Heinz; and Merkel, Rudolf, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg. Metering apparatus for liquids containing granular solids, in particular lapping liquid. 3,933,178, Cl. 137-608.000.
Eichenhofer, Kurt-Wilheim: *See*—
Waldmann, Helmut; Seifer, Hermann; Schwerdtel, Wulf; Swodenk, Wolfgang; and Eichenhofer, Kurt-Wilheim, 3,933,910.
Eichinger, Johann, to Carl Hurth, Maschinen- und Zahnradfabrik. Drive gear system for motor vehicles. 3,933,217, Cl. 180-70.00R.
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Eilhardt, Bernd: *See—*
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Eilingsfeld, Heinz: *See—*
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Eisenlohr, Karl-Heinz; Scholz, Berthold; and Kapp, Ernest, to Metallgesellschaft Aktiengesellschaft. Gas purifying method. 3,933,979, Cl. 423-239.000.

Elco Corporation: *See—*
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Elco Industries, Inc.: *See—*
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Elder, Joseph Marcus, Jr., to Bell Telephone Laboratories, Incorporated. Bias, feedback and network arrangements for hybrid circuits. 3,934,099, Cl. 179-170.0NC.

Electro Chemical Engineering GmbH: *See—*
Schmeling, Edith-Luise; Friebe, Herbert; and Reininghaus, Ulrich, 3,934,054.

Electrolysis Pollution Control Inc.: *See—*
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Eli Lilly and Company: *See—*
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Ellerbrock, Donald H.; and Bacon, John E., to Boise Cascade Corporation. End seam construction for composite containers. 3,933,298, Cl. 229-5.600.

Elliott, Curtis H., Jr., to W. R. Grace & Co. Method of increasing the thermal stability of crystalline zeolites. 3,933,983, Cl. 423-328.000.

Ellson, Douglas G. Clamp for concrete forms. 3,933,333, Cl. 249-43.000.

Elmgren, Staffan, to Allmanna Svenska Elektriska Aktiebolaget. Press for treating products under high pressure. 3,933,418, Cl. 425-405.00H.

Elmhurst, Richard F.: *See—*
Dulaney, Ernest N.; and Elmhurst, Richard F., 3,934,224.

Elmore, Gerald C. Fuel-air mixing apparatus for vehicles. 3,933,952, Cl. 261-145.000.

Emerson Electric Co.: *See—*
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Cunningham, Donald M.; and Santoro, Ralph, 3,934,116.
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Emhart Corporation: *See—*
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Emmons, Stuart Albert; Metcalfe, John Leonard; and Potts, John Winston, to Lever Brothers Company. Product for the treatment of cellulosic fabrics. 3,933,274, Cl. 222-94.000.

Enck, Richard S., Jr.; and Sackinger, James P., to Varian Associates. Image tube and method and apparatus for gating same. 3,934,170, Cl. 315-12.000.

Engeli, Federico, to Technical Arco Establishment-Schaan. Delayed action striking device which may be utilized for the priming of detonators. 3,933,095, Cl. 102-70.00R.

Enomoto, Takamichi: *See—*
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Environs Engineering Enterprises, Inc.: *See—*
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Epstein, Barry M.: *See—*
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Ernest Scragg & Sons Limited: *See—*
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Ernsthausen, Roger E., to Owens-Illinois, Inc. Method of manufacturing a multiple gaseous discharge display/memory panel having improved voltage characteristics. 3,932,920, Cl. 29-25.110.

Erskine, Harold L., to Great Canadian Oil Sands Limited. Recovering bitumen from large water surfaces. 3,933,651, Cl. 210-400.000.

Erwin Kampf Maschinenfabrik: *See—*
Hutzenlaub, Armin S. P., 3,932,919.

Erwin, Ransome W., to Austral-Erwin Engineering Co. Heat bonding fluorocarbon and other plastic films to metal surfaces. 3,933,550, Cl. 156-85.000.

Erwin, Ransome W., to Austral-Erwin Engineering Co. Apparatus for heat bonding fluorocarbon and other plastic films to metal surfaces. 3,933,567, Cl. 156-382.000.

Esaka, Akira: *See—*
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Escher-Wyss Limited: *See—*
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Eschweiler Bergwerks-Verein Aktiengesellschaft: *See—*
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Eskeli, Michael. Compressing centrifuge. 3,933,007, Cl. 62-401.000.

Eskeli, Michael. Multistage heat exchanger. 3,933,008, Cl. 62-401.000.

Esposito, Vincent J.: *See—*
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Etablissements Dutertre: *See—*
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Ethyl Corporation: *See—*
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Ettenreich, Ludwig; Reimann, Otto; and Greulich, Klaus, to Bau-Stahlgewebe GmbH. Continuous heat treating process for low carbon structural steels in bar form. 3,933,534, Cl. 148-12.00B.

Eue, Ludwig: *See—*
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Eutsler, Bernard C.: *See—*
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Evans, David John Ivor; and Masters, Ian M., to Sherritt Gordon Mines Limited. Treatment of lead sulphide bearing material. 3,933,973, Cl. 423-93.000.

Evans, Ernest G., to Reamco, Inc. Stabilizer. 3,933,395, Cl. 308-4.00A.

Evans, Orde R. Centralizer for production string including support means for control lines. 3,933,203, Cl. 166-241.000.

Evans, William Joshua, to Bell Telephone Laboratories, Incorporated. TTL circuit. 3,934,157, Cl. 307-213.000.

Evelove, Leon G.; Leone, John S.; and White, Don E., to TRW Inc. Ceramic circuit board mounted in housing and method of fabrication thereof. 3,934,074, Cl. 174-52.00R.

Evers, William J.; Pelse, Igor A.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 3-Furyl chalcogen alkyl sulfides. 3,933,863, Cl. 260-347.200.

Evertz, Egon. Process for repairing slag ladles. 3,934,107, Cl. 219-76.000.

Exxon Production Research Company: *See—*
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Exxon Research and Engineering Company: *See—*
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Langer, Arthur W., Jr.; and Whitney, Thomas A., 3,933,879.
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Fabco, Incorporated: *See—*
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Faber, Paul V.: *See—*
Gordon, Gerome; and Faber, Paul V., 3,933,595.

Fagerlund, Per, to Navire Cargo Gear International AB. Ship's loading ramp. 3,933,256, Cl. 214-15.00R.

Fahrbach, Gerhard; Seiler, Erhard; and Stein, Dieter, to BASF Aktiengesellschaft. Graft copolymers based on methyl methacrylate polymers. 3,933,943, Cl. 260-887.000.

Fahrbach, Gerhard: *See—*
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Falen, Walter S.: *See—*
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Falkehag, Sten I.; and Bailey, Carl W., III, to Westvaco Corporation. Modified sulfonated resin surfactants. 3,933,424, Cl. 8-34.000.

Family Products, Inc.: *See—*
Mastrovito, Donald, 3,933,269.

Fangmeier, Ralf; and Pohler, Carl-Ludwig, to Th. Kieserling & Albrecht. Method and apparatus for straightening end sections of elongated workpieces. 3,933,018, Cl. 72-7.000.

Fannin, Wayne V., to General Motors Corporation. Rebound control for energy absorber unit. 3,933,386, Cl. 293-70.000.

Fansteel Inc.: *See—*
Pierret, James A., 3,934,179.

Farallon Industries, Inc.: *See—*
Shamlian, Ralph B.; and Hollingsworth, Ashley J., 3,933,049.

Farnsworth, Albert M. Cleaning composition. 3,933,674, Cl. 252-171.000.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,933,752, Cl. 260-61.000.

Farona, Michael F.: *See—*
Hutchings, David A.; and Farona, Michael F., 3,933,681.

Fasciati, Alfred: *See—*
Back, Gerhard; and Fasciati, Alfred, 3,933,785.

Fassler, Michael H.; and Perron, James S., to United Technologies Corporation. Method for fabricating shell molds for the production of superalloy castings. 3,933,190, Cl. 164-26.000.

Fauerso, Walter E.: *See—*
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Fedeler, John Henry Ephraim: *See—*
Grzina, Anthony; and Fedeler, John Henry Ephraim, 3,933,655.

Feinstein, Allen I.; and Fields, Ellis K., to Standard Oil Company. Process for the preparation of phenylamines and carbazoles. 3,933,848, Cl. 260-315.000.

Fenyes, Joseph G. E.: *See—*
Buckman, Stanley J.; Fenyes, Joseph G. E.; Flanagan, Kenneth J.; Pera, John D.; and Pulido, Miguel L., 3,933,472.

Ferlazzo, Natale; Buzzi, Gian Fausto; and Ghirga, Marcello, to Societa' Italiana Resine S.p.A. Catalyst for the production of acrylonitrile, acrylic acid and acrolein. 3,933,686, Cl. 252-467.000.

Fernholz, Hans; and Neu, Hermann, to Hoechst Aktiengesellschaft. Process for preserving bread and bakery products with sorbic acid. 3,934,045, Cl. 426-331.000.

Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, to Ciba-Geigy Corporation. New sulphamoylbenzoic acid amides. 3,933,802, Cl. 260-239.700.

Fidi, Werner; and Marschall, Otto, to AKG-Akustische und Kino Gerate GmbH. Zigzag arrangement of helical springs in devices for generating artificial reverberation. 3,933,345, Cl. 267-168.000.

Fields, Ellis K.: *See—*
Feinstein, Allen I.; and Fields, Ellis K., 3,933,848.
Fillmann, Walter; and Kalmbach, Werner, to Fr. Hesser Maschinenfabrik AG. Machine for multiple article packaging. 3,932,981, Cl. 53-124.00D.
Fine Organics Inc.: *See—*
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Fiscella, Anthony J.; and Mackles, Leonard, to Bristol-Myers Company. Amine salts of acyl lactylic acids. 3,933,825, Cl. 260-268.00R.
Fischer, Adolf, to BASF Aktiengesellschaft. Herbicidal mixture of a benzofuranyl methanesulfonate and a substituted pyridazone. 3,933,460, Cl. 71-88.000.
Fischer, Adolf, to BASF Aktiengesellschaft. Herbicide. 3,933,461, Cl. 71-91.000.
Fischer, Adolf, to BASF Aktiengesellschaft. Mixture of substituted benzothiadiazinones and benzonitriles as herbicides. 3,933,462, Cl. 71-91.000.
Fischer, Adolf, to BASF Aktiengesellschaft. Herbicide. 3,933,464, Cl. 71-92.000.
Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Herbicide mixtures of 2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranylmethane sulfonate. 3,933,465, Cl. 71-92.000.
Fischer, Adolf, to BASF Aktiengesellschaft. Uracil and carbamate herbicide mixtures. 3,933,466, Cl. 71-92.000.
Fischer, Adolf, to BASF Aktiengesellschaft. Substituted nitroanilines and substituted 1, 3, 5-triazines as herbicidal mixtures. 3,933,467, Cl. 71-93.000.
Fischer, David J.; Kunz, Hans J.; and Norby, Thomas E., to Corning Glass Works. Glass electrode structure for radio capsule. 3,933,612, Cl. 204-195.00G.
Fischer, Donn R.: *See—*
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Fischer, Earl R.; and Taylor, Roland S., to General Motors Corporation. Carburetor. 3,933,951, Cl. 261-67.000.
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Fischman, Martin; and Williams, G. Norman, to GTE Sylvania Incorporated. Frequency discriminator utilizing surface wave devices. 3,934,207, Cl. 329-117.000.
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Foerster, Rolf F., to Thiokol Corporation. Thermoplastic elastomeric copolymers and terpolymers of tetrafluoroethylene and propylene and method of making the same. 3,933,773, Cl. 260-87.50B.
Foley, Gerard. Book strap. 3,933,287, Cl. 224-55.000.
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Fowler, Peter, to Cabot Corporation. Method and means for gas sampling in mass spectrometry. 3,933,047, Cl. 73-421.50R.
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Galitsyn, Alexandr Avdeevich. Power supply arrangement. 3,934,155, Cl. 307-112.000.
Gallay, Jean-Jacques; Bosshard, Rene; and Brenneisen, Paul, to Ciba-Geigy Corporation. Anthelmintic composition and method utilizing isothiocyanobenzazoles active ingredients. 3,934,017, Cl. 424-270.000.
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Gammelgaard, Niels. Bicycle having arched mounting tube for the steering member. 3,933,373, Cl. 280-278.000.
Gannett, Danforth K., to Bell Telephone Laboratories, Incorporated. Key generating system. 3,934,078, Cl. 178-22.000.
Gardner, Keith. Mechanical turning device for structural shapes. 3,933,253, Cl. 214-1.00Q.
Garskamp, Arnoldus, to U.S. Philips Corporation. Circuit arrangement for generating a stabilized direct voltage with superposition of a control voltage. 3,934,191, Cl. 323-22.00T.
Gartman, William W., to Texas Instruments Incorporated. Solution growth system for the preparation of semiconductor materials. 3,933,539, Cl. 148-171.000.
Gay, Eddie C.; and Martino, Fredric J., to United States of America, Energy Research and Development Administration. Method of preparing electrodes with porous current collector structures and solid reactants for secondary electrochemical cells. 3,933,520, Cl. 136-6.0LF.
Gebhard, John Charles, Jr.; Waggoner, Marion Glen; and Webster, James Lang, to Du Pont de Nemours, E. I., and Company. Preparation of powders having spherical-shaped particles from ionomer resins and ethylene/carboxylic acid copolymer resins. 3,933,954, Cl. 264-8.000.
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Gentile, Anthony L.; and Stafsudd, Oscar M., to Hughes Aircraft Company. Synthesization method of ternary chalcogenides. 3,933,990, Cl. 423-508.000.
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Glander, Fritz; and Eilhardt, Bernd, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Polymer composition for bonding to copper. 3,933,737, Cl. 260-45.9NC.

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Goddard, Lloyd E., to Ethyl Corporation. Phenol transalkylation process. 3,933,927, Cl. 260-624.00E.

Goddard, Murray C.; and Kicklighter, Ray S., to Eastman Kodak Company. Audio-visual learning system. 3,932,948, Cl. 35-9.00A.

Godel, Siegfried; and Viola, James J., to Sperry Rand Corporation. Hair styling device having vapor generating means. 3,934,114, Cl. 219-222.000.

Goffe, William L.; and Mammino, Joseph, to Xerox Corporation. Imaging system. 3,933,491, Cl. 96-1.500.

Gohda, Hidekiyo; and Kiku, Takashi, to Sumitomo Chemical Company, Limited. Method for draining water or moisture from substratum for waterproofing layer. 3,933,546, Cl. 156-71.000.

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Gompert, Leon T., to Rockwell International Corporation. Servoed indicating apparatus. 3,934,196, Cl. 324-99.00R.

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Gordon, Gerome; and Faber, Paul V., to Wilputte Corporation. Oven door fume collection system. 3,933,595, Cl. 201-2.000.

Gordon, Richard A. Animal exercise device. 3,933,126, Cl. 119-29.000.

Goretta, Louis A.; and Newkirk, John D., to Nalco Chemical Company. Polymerization of maleic anhydride and vinyl acetate. 3,933,763, Cl. 260-78.50R.

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Goser, Karl, to Siemens Aktiengesellschaft. Process for the production of a pair of complementary field effect transistors. 3,933,529, Cl. 148-1.500.

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Gould, Richard H.; Ludwig, George; Walters, William J.; and VanOphem, Remy J., to Bendix Corporation, The. Altitude compensated vacuum regulating valve. 3,933,166, Cl. 137-102.000.

Graham, Craig E., to Dow Corning Corporation. Optically clear organosilicon compounds. 3,933,678, Cl. 252-300.000.

Graham, Frederick A., to Clark Equipment Company. Overhead guard for lift trucks. 3,933,371, Cl. 280-150.00C.

Granger, Maurice. Support apparatus for a portable shower head. 3,933,329, Cl. 248-295.000.

Grant, Charles P., Jr.: *See—*
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Grasselli, Robert K.: *See—*
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Grasvoll, Halvor. Tool for welding together two plastics films wrapping an object. 3,933,569, Cl. 156-515.000.

Gravett, David Lawrence: *See—*
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Gray, Darby A.: *See—*
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Greco, Nicholas P., to Koppers Company, Inc. Hydrolysis of toluene diamines to produce methyl resorcinols. 3,933,925, Cl. 260-621.00M.

Green, Donald T.; and Snarr, James L., to United States Steel Corporation. X-ray machine for rapid and precise inspection of mixed sizes of pneumatic tires. 3,934,144, Cl. 250-358.00T.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Certain 1,4-bis-(morpholino)-2-butene-containing condensation products and their preparation. 3,933,812, Cl. 260-246.00B.

Greene, Carole Oman: *See—*
Kolbensvik, Joel Robert; and Greene, Carole Oman, 3,933,399.

Grenness, Torbjorn. Synthetic rubber solutions. 3,933,723, Cl. 260-33.60A.

Grenon, Lawrence A.; and Coleman, Michael G., to Motorola, Inc. Scannable light emitting diode array and method. 3,932,927, Cl. 29-577.000.

Greulich, Klaus: *See—*
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Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,934,019.

Groothoff, Adriaan Jacob; van der Heijde, Martin Clemens; Van Leeuwen, Johannes Aloysius; and Panis, Constantius Johannes Waltherus, to U.S. Philips Corporation. Picture display device and deflection coil both having self-aligning surfaces. 3,934,169, Cl. 313-477.000.

Grotepas, Frans: *See—*
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Grove Valve and Regulator Company: *See—*
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Grunewalder, Werner; and Frotscher, Herbert, to Henkel & Cie GmbH. Method of cleaning textiles. 3,933,425, Cl. 8-142.000.

Gruppo Lepetit S.p.A.: *See—*
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Grzesik, Marian F.: *See—*
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Grzina, Anthony; and Fedeler, John Henry Ephraim, to Warman Equipment International. Cable-controlled thickener. 3,933,655, Cl. 210-528.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Stewart, James A., 3,934,089.

GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Peltz, John Robert, 3,933,022.

Guala, Piergiacomo, to S.A.S. Angelo Guala di Piergiacomo e Roberto Guala & C. Security bottle closure device. 3,933,284, Cl. 222-500.000.

Guerci, Carlo: *See—*
Pagella, Elio; and Guerci, Carlo, 3,932,961.

Guibord, Georges E.; and Guibord, Marcel P. All terrain pleasure vehicle. 3,933,214, Cl. 180-9.20R.

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Gunderson, Philip D., to Motorola, Inc. Zero crossing circuit for electronic ignition system. 3,933,141, Cl. 123-148.00E.

Gunkel, Alfred Alexander: *See—*
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Gurtler, Rudolf, to Mahle GmbH. Combustion chamber protection means. 3,933,143, Cl. 123-193.00P.

Gurzheev, Valery Nikolaevich: *See—*
Bokov, Jury Sergeevich; Gurzheev, Valery Nikolaevich; Zakharov, Vladimir Ivanovich; Korsakov, Vladimir Sergeevich; Lavrischev, Vadim Petrovich; Goron, Alla Grigorievna; Glikman, Mark Leonovich; Semenov, Nikolai Nikolaevich; and Matvienko, Viktor Yakovlevich, 3,933,609.

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Gussin, Robert Zalmon; and Meriwether, Lewis Smith, to American Cyanamid Company. Method of removing toxic substances from the intestinal tract by the use of a surfactant and a sorbent. 3,934,007, Cl. 424-125.000.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*— Bammert, Karl; Krapp, Reinhard; and Krey, Gunter, 3,932,996.

Guth, Hans; Kaiser, Hans-Joachim; Kleine-Weischede, Klaus; Wieschen, Hermann; and Kuhnlein, Hans L., to HCH. Bertrams Aktiengesellschaft; and Bayer Aktiengesellschaft. Separation of corrosive liquid mixtures. 3,933,575, Cl. 159-.19..

Guthrie, Robert William: *See*— Brossi, Arnold; Guthrie, Robert William; and Kierstead, Richard Wightman, 3,933,827.

Gwin, Edward S., to General Motors Corporation. Latch mechanism. 3,933,330, Cl. 248-371.000.

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Haag, Charles W., to Whirlpool Corporation. Refrigeration apparatus enclosure structure. 3,933,398, Cl. 312-214.000.

Haas, Franz; Haas, Franz; and Haas, Johann. Process for manufacturing hollow pastries. 3,934,043, Cl. 426-283.000.

Haas, Franz: *See*— Haas, Franz; Haas, Franz; and Haas, Johann, 3,934,043.

Haas, Georges; Jaques, Roland; Rossi, Alberto; and Ruegg, Martin, to Ciba-Geigy Corporation. New aliphatically substituted aryl-chalcogeno-hydrocarbon derivatives. 3,933,835, Cl. 260-295.5ÖT.

Haas, Georges: *See*— Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, 3,933,802.

Haas, Johann: *See*— Haas, Franz; Haas, Franz; and Haas, Johann, 3,934,043.

Haas, Larry A.; Khalafalla, Sanaa E.; and Anderson, Carl F., to United States of America, Interior. Method for the decomposition of hydrogen sulfide. 3,933,608, Cl. 204-164.000.

Haas, Rainer, to Hans Hollmuller, Maschinenbau, Firma. Method of etching copper and copper alloys. 3,933,544, Cl. 156-19.000.

Haase, Ralf: *See*— Printz, Gerhard; and Haase, Ralf, 3,933,565.

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Haberkorn, Axel; Kolling, Heinrich; Kranz, Eckart; and Schramm, Jurgen, to Bayer Aktiengesellschaft. 1-(4-Phenoxyphenyl)-1,3,5-triazines. 3,933,814, Cl. 260-248.0NS.

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Haefele, John William, to Procter & Gamble Company, The. Oral compositions for plaque, caries and calculus retardation with reduced staining tendencies. 3,934,002, Cl. 424-54.000.

Haga, Kazuo: *See*— Yukuta, Toshio; Aoki, Takao; Haga, Kazuo; Ohashi, Takashi; and Saito, Masumi, 3,933,768.

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Hagino, Hiroyasu; Kajiwara, Yasuya; and Nagai, Seiichi, to Mitsubishi Denki Kabushiki Kaisha. Process of producing semiconductor planar device. 3,933,541, Cl. 148-187.000.

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Hallerback, Stig Lennart; and Lachonius, Leif, to SKF Industrial Trading and Development Company, B.V. Method of making a sectioned stator for a dynamoelectric machine. 3,932,929, Cl. 29-596.000.

Halley, James L., to Tesco Chemicals, Inc. Jet action chemical feeding apparatus. 3,933,169, Cl. 137-268.000.

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Ham, William C.; Dodd, Francis J.; and Friedrick, Spencer J. Ultrasonic calibration standard. 3,933,026, Cl. 73-1.00R.

Hamanaka, Ernest S., to Pfizer Inc. 6-[α-(ω-quanidinoalkanoylamido)acylamido]penicillanic acids. 3,933,797, Cl. 260-239.100.

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Hanes, Donald M. Sharpener for rotary electric razor. 3,932,967, Cl. 51-358.000.

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Hanyuda, Toshiaki; and Takiyama, Eiichiro, to Showa Highpolymer Co., Ltd. Polymerizable cycloacetal resinous composition. 3,933,857, Cl. 260-340.700.

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Harada, Mas, to Seeburg Corporation. Acoustic coupler for use with auditory equipment. 3,934,100, Cl. 179-182.00R.

Harding, George W., to Poly-San Corporation. Method of making chemical toilet cabana. 3,932,925, Cl. 29-428.000.

Hardman, Wendell G.; and Brunhart, Werner, to Varian Associates. Grid support means for a planar tube. 3,934,168, Cl. 313-293.000.

Hare, Peter Edgar, to Durrum Instrument Corporation. Constant flow system for detection of amino acids. 3,933,430, Cl. 23-230.00R.

Harms, Harry Keith, to Gesler, Saul. Water treatment process and apparatus. 3,933,606, Cl. 204-152.000.

Harmsen, Ulf O.; and Pottken, Wolfgang S., to Dr. Eugene Durrwachter DODUCO. Method for manufacturing a ductile silver metallic oxide semi-product. 3,932,935, Cl. 29-630.00C.

Harmsen, Ulf O.; Pottken, Wolfgang; and Oertel, Egon, to Dr. Eugene Durrwachter DODUCO. Method of manufacturing a ductile silver metallic oxide semi-finished product contacts. 3,932,936, Cl. 29-630.00C.

Harrel, Jack D.: *See*— Schoonover, Stanley C.; and Harrel, Jack D., 3,934,185.

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Havinga, Reginoldus; and Wildschut, Antoon, to Akzo N.V. Process for the preparation of cycloalkylalkane carboxylic acid. 3,933,903, Cl. 260-514.00R.

Hawkins, Arthur Ernest, to Lever Brothers Company. Process for the manufacture of a cooked fibrous restructured meat product. 3,934,050, Cl. 426-645.000.

Hay, Wayne W., to Airco, Inc. Anesthesia breathing circuit with positive end expiratory pressure valve. 3,933,171, Cl. 137-493.700.

Hayakawa, Kyohei; and Maeda, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Program control system for robots for industrial use. 3,934,186, Cl. 318-567.000.

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Hedgewick, Peter; and Birrell, Stewart H., to Reflex Corporation of Canada Limited. Triangular signalling device. 3,933,119, Cl. 116-63.00P.
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Heimann, Fred G.; and Abbott, Richard, to Fruehauf Corporation. Laminated floor manufacturing method. 3,933,549, Cl. 156-79.000.
Heintzelman, William J.; and Naiman, Michael I., to Petrolite Corporation. Polishes containing wax-anhydride compounds. 3,933,511, Cl. 106-10.000.
Heintzelman, William J.; and Naiman, Michael I., to Petrolite Corporation. Carbon paper inks containing wax-anhydride compounds. 3,933,512, Cl. 106-22.000.
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Herd, David P.; McCaskill, John W.; and Childers, Thomas W., to Exxon Production Research Company. Balanced stem fail-safe valve system. 3,933,338, Cl. 251-63.600.
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Hess, Hans-Jurgen E.; and Nelson, Roger P., to Pfizer Inc. 18β-Glycyrrhetinic acid amides useful as antiulcer agents. 3,934,027, Cl. 424-309.000.
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Hill, Eugene R., to United States of America, Navy. AM/AGC weighted diversity combiner/selector. 3,934,204, Cl. 325-304.000.
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Hoer, Kenneth Leon, to Deere & Company. O-Ring port contour sheath and seal. 3,933,358, Cl. 277-170.000.
Hoerner Waldorf Corporation: *See—*
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Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Heat-activatable, storage-stable polyurethane powders. 3,933,759, Cl. 260-77.5TB.
Hoff-Stevens, Inc.: *See—*
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Hofmann, Ernst; and Herrle, Karl, to BASF Aktiengesellschaft. Manufacture of insoluble and only sparingly swellable poly-N-vinylpyrrolidone-2 or copolymers of N-vinylpyrrolidone with other N-vinyllactams. 3,933,766, Cl. 260-80.30R.

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Holl, Walter; and Scholpp, Martin, to Robert Bosch G.m.b.H. Method of manufacturing carbon brushes for electrical machines. 3,933,687, Cl. 252-511.000.

Holland Company: *See—*
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Honey, Colin George; and Jones, Stanley Leonard, to British Aluminium Company Limited, The. Method of electrolytically extracting gallium from aluminate solutions. 3,933,604, Cl. 204-123.000.

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Hood, John C. Bearing and support structure for speed racing roller skate. 3,933,397, Cl. 308-180.000.

Hoogeboom, Thomas J., to General Electric Company. Thermally stable translucent polycarbonate composition. 3,933,730, Cl. 260-37.0PC.

Hoogeboom, Thomas J.: *See—*
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Hopkins, George C.; and Merrifield, D. Bruce, to Hooker Chemicals & Plastics Corporation. Halogen containing polymeric resins having improved heat and light stability. 3,933,740, Cl. 260-45.75W.

Hopkins, George C.: *See—*
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Houben, Heinz, to A. Monforts. Method of dyeing a textile web. 3,932,905, Cl. 8-149.100.

Houck, Theodore B., to Parker Drilling Company, Inc. Deep drilling machine demountable for helicopter transport. 3,933,059, Cl. 74-661.000.

Hounsfield, Godfrey Newbold, to E M I Limited. Radiography. 3,934,142, Cl. 250-360.000.

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Hughes, Merfyn Jones; Shorten, Derek William; and Smith, Graham Westley, to Bakelite Xylonite Limited. Shrink-wrapping of articles. 3,933,244, Cl. 206-497.000.

Huie, Joe. Device for massaging a finger. 3,933,151, Cl. 128-52.000.

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Humphrey, William M., Jr.: *See—*
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Hutchings, David A.; and Farona, Michael F., to Goodyear Tire & Rubber Company, The. Activation of copper salt phenol oxidation catalysts. 3,933,681, Cl. 252-413.000.

Hutchins, Alma A. Straight line abrading tool. 3,932,963, Cl. 51-170.0TL.

Hutchins, Marvin H. Musical instrument capo. 3,933,073, Cl. 84-318.000.

Hutter, Rudolf G. E.; and Dressel, Herman O., to GTE Laboratories Incorporated. Double grid clectron gun system and method of use. 3,934,171, Cl. 315-30.000.

Hutzenlaub, Armin S. P., to Erwin Kampf Maschinenfabrik. Improved gripper return means for a machine for simultaneously biaxially stretching thermoplastic film. 3,932,919, Cl. 26-57.00R.

Huyffer, Paul S., to Polaroid Corporation. 3,3-Disubstituted phthalides and naphthalides. 3,933,849, Cl. 260-315.000.

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Ikeda, Sakuji; Ozaki, Atsumu; Okawara, Makoto; Mizoroki, Tsutomu; Uchino, Masahiro; Shirakawa, Hideki; and Kawata, Noboru, to Tokyo Institute of Technology. Method of preparing transition metal complex catalysts. 3,933,770, Cl. 260-87.50R.

Ikeda, Tadashi: *See—*
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Iiardi, Joseph M.; Walden, John; and Rau, Eric, to Intermountain Research and Development Corporation. Process for producing sodium carbonate. 3,933,977, Cl. 423-206.00T.

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Imanaka, Takuichi; and Kan, Takahiro, to Kawasaki Steel Corporation. Method for producing electrical steel sheets having a very high magnetic induction. 3,933,537, Cl. 148-112.000.

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Inuzuka, Takahiko: *See—*
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Ireland, Thomas R., to Hallmark Findings Inc. Earring having pivoted one-piece earwire with means for limiting lateral shift. 3,933,009, Cl. 63-12.000.

Iriarte, Jose: *See—*
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Irikura, Tsutomu, to Kyorin Seiyaku Kabushiki Kaisha. N-benzenesulfonyl-β-alanine hydrazide useful as an immunosuppressive agent. 3,934,036, Cl. 424-321.000.

Irion, Reinhard: *See—*
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Irving, Alasdair John, to J. I. Case Company. Side-shift backhoe. 3,933,259, Cl. 214-138.00C.

Irwin, Gordon A., to Steiger Tractor Inc. Vehicle with aligned intake and exhaust pipes. 3,933,216, Cl. 180-54.00R.

Iseman, Walter J., to Sundstrand Corporation. Toroidal traction drive. 3,933,054, Cl. 74-200.000.

Ishibashi, Motochika; Inuzuka, Takahiko; and Maegawa, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Electroplating method and apparatus. 3,933,601, Cl. 204-25.000.

Ishida, Yoshio; Ono, Hiroshi; and Takemura, Reiji, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolysis of alkali metal chloride. 3,933,603, Cl. 204-98.000.

Ishige, Sadao: *See—*
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Isley, Walter F., to Teledyne Industries, Inc. Liquid fuel purification system. 3,933,638, Cl. 210-97.000.

Isonaka, Kenji; Hokari, Saburo; Watanabe, Tatsuya; and Furukawa, Masamichi, to Ricoh Co., Ltd. Identification card producing apparatus. 3,934,256, Cl. 354-3.000.

Isozaki, Osamu; and Iwase, Seigo, to Kansai Paint Company, Ltd. Polyester with epoxy monomer, and a cross-linking monomer. 3,933,939, Cl. 260-872.000.

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Ito, Mizuo: *See—*
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Ito, Ryoichi: *See—*
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Itoh, Hayami; Yamada, Mamoru; and Nozaki, Yasuo, to Kawasaki Jukogyo Kabushiki Kaisha. Method for disposal of waste synthetic high polymer. 3,933,989, Cl. 423-481.000.

Itoh, Yasuo: *See—*
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Iwai, Sakuya; and Hirose, Takao, to Nippon Oil Company Ltd. Polychloroprene-base adhesive composition. 3,933,719, Cl. 260-31.2MR.

Iwai, Sakuya; and Hirose, Takao, to Nippon Oil Company Ltd. Polychloroprene type adhesive compositions. 3,933,720, Cl. 260-31.2MR.

Iwasa, Mitsuhiro: *See—*
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Jacobson, Nils Bertil: *See—*
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Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Apparatus for reading a disk-shaped record carrier to be played on a turntable. 3,934,080, Cl. 178-6.60R.

Jansson, Ake: *See—*
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Janu, George J.; and Fischer, Donn R., to Johnson Service Company. Fluidic machine cycle control. 3,933,065, Cl. 83-62.000.

Japan Atomic Energy Research Institute: *See—*
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Johnson, Larry K., to Lawrence Brothers Inc. Pivot assembly. 3,932,913, Cl. 16-130.000.
Johnson, Robert E., to Whirlpool Corporation. Vacuum cleaner. 3,932,912, Cl. 15-410.000.
Johnson, Robert P.: *See*—
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Johnson, William H., to Research Corporation. Modular tobacco handling and curing system and method. 3,932,946, Cl. 34-201.000.
Johnston, Charles, to Mizzy Inc. Pressure injector apparatus having improved trigger mechanism. 3,933,155, Cl. 128-173.00H.
Jones, Geraint, to Imperial Chemical Industries Limited. Heterocyclic compounds. 3,933,818, Cl. 260-250.00C.
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Klaeger, Joseph H. Closed loop booster system pneumatic actuator for oil wells. 3,932,990, Cl. 60-369.000.
Klaeger, Joseph H. Snifter valve useful in control means for a piston in a cylinder. 3,933,175, Cl. 137-595.000.
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Kolev, Konstantin Nikolaev; and Malinowski, Jordan Petrov, to Zlafop pri Ban. Direct-positive photographic material and method for its production. 3,933,496, Cl. 96-48.00R.
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Kondo, Hiroyuki; Hotta, Atsuo; Hayasaka, Akio; and Suzuki, Michio, to Hitachi, Ltd. Method of manufacturing semiconductor device. 3,933,540, Cl. 148-187.000.
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Korver, Jan Abraham Cornelis, to U.S. Philips Corporation. Circuit arrangement for generating a deflection current through a coil for vertical deflection in a display tube. 3,934,173, Cl. 315-408.000.
Kosaka, Kenzo; Morioka, Shin; Shibata, Kunio; Goto, Takashi; and Takahashi, Eizi, to Mitsubishi Rayon Co., Ltd. Method for manufacturing a textured synthetic multifilament yarn having alternately grouped S and Z twists. 3,932,986, Cl. 57-157.0TS.
Kosaka, Shinya; Furuta, Kenji; and Nakayama, Akira. Vital phenomenon recording and/or reproducing device. 3,934,267, Cl. 360-6.000.
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Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolylimidazolines. 3,933,839, Cl. 260-306.80D.

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Kronlokken, Loren; and Lehmann, Guenter Fritz, to Marion Power Shovel Co., Inc. Hoist system for power shovels. 3,933,260, Cl. 214-138.00R.

Krull, Frank B. Method of and apparatus for dry mixing. 3,933,340, Cl. 259-14.000.

Krutchen, Charles M., to General Electric Company. Meet extrudable polyacetylene copolymer blends. 3,933,722, Cl. 260-32.400.

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Kushibe, Kazuyoshi. Method of stabilizing acid aqueous solutions of hydrogen peroxide. 3,933,982, Cl. 423-272.000.

Kushlefsky, Bernard G.; and Treadwell, Kenneth, to M & T Chemicals Inc. Urethane foam catalyst. 3,933,692, Cl. 260-2.5AC.

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Lakhani, Kishor M., to Honeywell Information Systems, Inc. Drying and fixing techniques for electrographic printing system. 3,934,112, Cl. 219-216.000.

Lal, Joginder; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Sulfur vulcanizable interpolymers. 3,933,769, Cl. 260-80.780.

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Lampe, John G.; and Wall, Willie E., to Armstrong Cork Company. Foamed poly(vinyl chloride) drawer sides. 3,933,401, Cl. 312-330.0SM.

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Langer, Arthur W., Jr.; and Whitney, Thomas A., to Exxon Research and Engineering Company. Chelated lithium aluminum compounds. 3,933,879, Cl. 260-448.00R.

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Larson, Roy E.; and Forester, Ralph H., Jr., to North Star Research Institute. Process for manufacturing ultrathin polymer membranes and products derived therefrom. 3,933,561, Cl. 156-246.000.

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Lee, Chi-Long; and Maxson, Myron T., to Dow Corning Corporation. Tube method for the preparation of olefinic siloxane compounds. 3,933,882, Cl. 260-448.20E.

Lee, Chi-Long: *See*—
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Lee, Kwan-hua, to University of California, The Regents of the. Acne and psoriasis treatment with retinoic acid analogs. 3,934,028, Cl. 424-318.000.
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Leva, Max. Apparatus for deodorizing fats and oils. 3,933,953, Cl. 261-148.000.
Levenson, Elliott R., to United States of America, Air Force. Fluid flow stripping and plating system. 3,933,615, Cl. 204-275.000.
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Lindemann, Martin K., to Chas. S. Tanner Co. Crushed foam-backed fabrics and emulsions for producing the same. 3,933,691, Cl. 260-2.50L.
Lindley, John P.; and Rieden, James, to Itek Corporation. Electro-optic system with expanded power range. 3,934,153, Cl. 250-578.000.
Link, Helmut. Apparatus for hydraulically operating the chuck of the hollow spindle of a lathe. 3,933,061, Cl. 82-30.000.
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Gould, Richard H.; Ludwig, George; Walters, William J.; and VanOphem, Remy J., 3,933,166.
Lummus Company, The: *See—*
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Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; Prick von Wely, Francois; and Winzentsen, Uwe, 3,933,349.
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Lunch Locker Systems Limited: *See—*
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Lundbohm, Lennart: *See—*
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Luscombe, Art. Chopping implement. 3,933,314, Cl. 241-60.000.

Lutzmann, H. Harald: *See—*
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Lyle, Richard E.; and Foehr, Edward G., to Chevron Research Company. Extended life functional fluid. 3,933,659, Cl. 252-32.70E.

Lynch, James Edward; and Fussleman, David Francis, to AMP Incorporated. Method of connecting terminal posts of a connector to a circuit board. 3,932,934, Cl. 29-628.000.

Lyons, John H.; Little, Steven M.; and Esposito, Vincent J., to United States of America, Navy. Chemiluminescent signal device. 3,933,118, Cl. 116-63.00P.

Lysher, Wayne M., to McDonnell Douglas Corporation. Process for producing microspheres. 3,933,955, Cl. 264-9.000.

M & T Chemicals Inc.: *See—*
Kushlefsky, Bernard G.; and Treadwell, Kenneth, 3,933,692.
Larkin, William A.; and Ringwood, Robert C., Jr., 3,933,741.
Wowk, Anatole, 3,933,680.

Macano, Samuel J., to General Signal Corporation. Automatic vehicle operation system. 3,934,125, Cl. 235-150.200.

Macey, George Edward: *See—*
Baker, William Albert; Wootton, Eric Arthur; King, Sidney Reginald; Collins, Donald Louis William; and Macey, George Edward, 3,933,193.

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Machida, Hazime; and Okuno, Zenjiro, to Kabushiki Kaisha Ricoh. Double dispersion acrylate or methacrylate wet deveioper. 3,933,667, Cl. 252-62.10L.

Machlett Laboratories, Incorporated, The: *See—*
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Mackey, E. Scudder, to GAF Corporation. Photographic element of improved antistatic and slippage properties containing calcium stearate dispersion and stearamido-propyl dimethyl-beta-hydroxy-ethyl ammonium nitrate; gelatinous composition, and method, for preparing said element. 3,933,516, Cl. 106-131.000.

Mackles, Leonard: *See—*
Fiscella, Anthony J.; and Mackles, Leonard, 3,933,825.

Mackta, Leo. Pigment package for dental filling materials. 3,932,938, Cl. 32-15.000.

MacMaster, George H.; and Dudley, Kenneth W., to Raytheon Company. Microwave browning means. 3,934,106, Cl. 219-10.55E.

MacMaster, George H.: *See—*
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MacNabb, William V., to General Electric Company. Plutonium fuel adjacent burnable poison. 3,933,582, Cl. 176-78.000.

Macy, Robert L.: *See—*
Bradley, William S.; Lea, James F., Jr.; and Macy, Robert L., 3,933,308.

Madden, Dale A., to Atlantic Research Corporation. Propellant compositions containing a staple metal fuel. 3,933,543, Cl. 149-21.000.

Madderra, Galen K.; and Ziegenhain, William C., to Continental Oil Company. Method for producing catalyst impregnated alumina extrudates. 3,933,685, Cl. 252-464.000.

Maeda, Hidekatsu; Yamauchi, Aizo; Suzuki, Hideo; and Kamibayashi, Akira, to Agency of Industrial Science & Technology. Method for production of immobilized enzyme. 3,933,587, Cl. 195-68.000.

Maeda, Hiroshi: *See—*
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Magerlein, Barney J., to Upjohn Company, The. 4,5-Cis-didehydro-PGF_1 analogs. 3,933,889, Cl. 260-468.00D.

Maguire, Richard J., to Gillette Company, The. Shield assembly for flexible belt carrier mechanism. 3,933,238, Cl. 198-189.000.

Mahle GmbH: *See—*
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Maida, Osamu, to Nippon Kogaku K.K. Device for generating a signal for a predetermined interval after a power switch is opened. 3,934,178, Cl. 317-141.00S.

Maier, Christian, to Ciba-Geigy Corporation. Aerosol dispenser for fluid products comprising a piston pump assembly for generating compressed air. 3,933,279, Cl. 222-193.000.

Maier, Elmar, to Hilti Aktiengesellschaft. Explosion-driven bolt setting gun with drum magazine. 3,933,290, Cl. 227-9.000.

Maietta, Peter J. Vehicle distress warning device. 3,933,117, Cl. 116-28.00R.

Mailfert, Alain, to Agence Nationale de Valorisation de la Recherche (ANVAR). Polyphase synchronous electrical machine with superconductor winding. 3,934,163, Cl. 310-10.000.

Main, Brian Geoffrey, to Imperial Chemical Industries Limited. 1-Aryl-2-amidoalkylaminoethanol derivatives. 3,933,911, Cl. 260-562.00N.

Majefski, Richard L. Low power consumption stereo transmitter and receiver system. 3,934,201, Cl. 325-36.000.

Malinowski, Jordan Petrov: *See—*
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Mamedov, Ulchar Ashraf ogly: *See—*
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Manghisi, Elso; Cascio, Giuseppe; and Bastianini, Liliana, to Instituto Luso Farmaco d'Italia S.r.l. New beta-aminoketone derivatives. 3,933,803, Cl. 260-240.00G.

Manghisi, Elso; Salimbeni, Aldo; and Fregnan, Giancarlo, to Instituto Luso Farmaco d'Italia S.r.l. 5-Substituted 2-amino-4-arylthiazoles. 3,933,838, Cl. 260-306.80R.

Mangin, Pierre: *See—*
Bailly, Jean Claude; Durand, Daniel; and Mangin, Pierre, 3,933,934.

Mangs, Josefa: *See—*
Michaud, Horst; Seeholzer, Josef; Pentzel, Ludwig; and Mangs, Josefa, 3,933,755.

Manning, Robert E., to Sandoz, Inc. Hydroxy substituted diphenylalkyls for treatment of lipidemia. 3,934,034, Cl. 424-346.000.

Marchant, Wayne N., to United States of America, Interior. Method for removing soluble selenium from acidic waste water. 3,933,635, Cl. 210-50.000.

Margraf, Adolf. Method of filtering dust-laden gases. 3,933,978, Cl. 423-215.500.

Marino, Francis C., to Redactron Corporation. Data terminal for connection to telephone or teleprinter facilities. 3,934,088, Cl. 179-2.0DP.

Marion Power Shovel Co., Inc.: *See—*
Kronlokken, Loren; and Lehmann, Guenter Fritz, 3,933,260.

Mark, Victor; and Hoogeboom, Thomas J., to General Electric Company. Flame retardant polycarbonate composition. 3,933,734, Cl. 260-45.70S.

Mark, Victor, to Monsanto Company. Substituted polyhalogenated cyclopentadienes. 3,933,922, Cl. 260-611.00R.

Markum, Arvel Dean, to General Dynamics Corporation. Cryostat control. 3,933,003, Cl. 62-85.000.

Marlinski, Edward J., to Stromberg-Carlson Corporation. Controlled epoxy dispensing technique as related to transistor chip bonding. 3,933,187, Cl. 141-392.000.

Marostica, Jerome L.; and McLaughlin, William L., to BHB Corporation. Construction equipment. 3,933,261, Cl. 214-138.00R.

Marschall, Otto: *See—*
Fidi, Werner; and Marschall, Otto, 3,933,345.

Marsh, Charles M. Game device for two or more persons which is used with the feet. 3,933,353, Cl. 272-70.000.

Marsh, Ronald W.: *See—*
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Martin, James D.: *See—*
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Martin, Louis E., to Poclain. Pressurized fluid supply power control means. 3,932,992, Cl. 60-431.000.

Martin, Marion A. Apparatus for welding. 3,933,292, Cl. 228-49.000.

Martin, Oscar M., Jr., to United States of America, Navy. Helicopter blind landing and hover system. 3,934,250, Cl. 343-6.0ND.

Martini, Bruno; Pusch, Gunter; Rossler, Erich; and Walz, Dieter, to Ciba-Geigy Corporation. Process for making textiles containing cellulose crease-resistant. 3,933,426, Cl. 8-183.000.

Martino, Fredric J.: *See—*
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Martonair Limited: *See—*
Corrie, Nicholas John Byrom, 3,933,080.

Maruyama, Isamu: *See—*
Yamamoto, Hisao; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; and Katayama, Shigenari, 3,933,824.

Maruyama, Nobuo; and Sakaguchi, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Casting mold for metals. 3,933,335, Cl. 249-114.000.

Maruyama, Shoji; and Enomoto, Takamichi, to Kabushiki Kaisha Ricoh. Novel photoconductive substances and their application. 3,933,492, Cl. 96-1.500.

Maruzen Oil Co. Ltd.: *See—*
Machi, Sueo; Matui, Yasushi; Shinano, Takayuki; Aono, Taiji; Hibi, Yoshiharu; Oshima, Shozo; and Kashiki, Masayuki, 3,933,731.

Marvin Glass & Associates: *See—*
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Maschinenfabrik Reinhausen Gebruder Scheubeck K.G.: *See—*
Bleibtreu, Alexander; Breuer, Wolfgang; and Mieske, Hans-Henning, 3,934,174.

Mason, Charles H.; and Sitton, Roy S., to United States of America, Energy Research and Development Administration. Adjustable electronic load-alarm relay. 3,934,239, Cl. 340-248.00A.

Massachusetts Institute of Technology: *See—*
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Massarani, Elena: *See—*
Nardi, Dante; Massarani, Elena; and Degen, Ludwig, 3,933,793.

Massoubre, Jean-Marie, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Thin, continuous steel wires. 3,933,441, Cl. 29-183.500.

Masters, Ian M.: *See—*
Evans, David John Ivor; and Masters, Ian M., 3,933,973.

Mastrovito, Donald, to Family Products, Inc. Handle assembly for chest. 3,933,269, Cl. 220-94.00R.

Masu, Masanobu: *See—*
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; and Okabe, Masao, 3,933,941.

Masuda, Takao: *See—*
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Masui, Kazuo: *See—*
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Mateju, Vladimir; Zabrodsky, Zdenek; Vasek, Vitezslav; and Jekl, Frantisek, to Vyzkumny ustav bavlnarsky. Method of and weft inserter for eliminating a chain formation of wefts not transferred into the beat-up position in travelling-wave shedding looms. 3,933,183, Cl. 139-12.000.

Mateju, Vladimir; Zabrodsky, Zdenek; Vasek, Vitezslav; and Bleha, Josef, to Vyzkumny ustav bavlnarsky. Method of and weft inserter for eliminating a chain formation of wefts not transferred into the beat-up position in travelling-wave shedding looms. 3,933,184, Cl. 139-12.000.

Mathis, Ronald D.; Underwood, John H.; and Dix, James S., to Phillips Petroleum Company. Dyeable polymers of alpha-olefins containing a nickel salt and a terephthalic ester. 3,933,707, Cl. 260-23.00H.

Matovich, Edwin. High temperature chemical reactor. 3,933,434, Cl. 23-252.00R.

Matras, Thad E. Ferrocement structures and method. 3,932,969, Cl. 52-86.000.

Matsuda, Hideaki; and Okamoto, Takanori, to Okura Kogya Kabushiki Kaisha. Anaerobic adhesive containing tetrahydroquinoline and benzosulfimide. 3,933,748, Cl. 260-47.0EP.

Matsuda, Masakata: *See—*
Sato, Yohta; Matsuda, Masakata; Ohi, Yukio; and Matsumori, Toyomi, 3,933,477.

Matsui, Katsuaki: *See—*
Murayama, Keisuke; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayu, 3,933,735.

Matsumori, Toyomi: *See—*
Sato, Yohta; Matsuda, Masakata; Ohi, Yukio; and Matsumori, Toyomi, 3,933,477.

Matsumoto, Fumio; Kuroki, Katuro; Takashima, Kunihide; Takata, Toshihiko; Yasumoto, Hiromichi; and Honda, Kuniyasu, to Nippon Steel Corporation. Method for cold rolling of a high magnetic flux density grain-oriented electrical steel sheet or strip having excellent properties. 3,933,024, Cl. 72-364.000.

Matsumoto, Takaaki; and Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Photographic sheet-like film feeding device. 3,934,150, Cl. 250-468.000.

Matsumura, Isao: *See—*
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Matsumura, Yasuo; Kishimoto, Soichiro; and Ozaki, Masahiko, to Japan Exlan Company Limited. Process for producing carbon fibers. 3,933,986, Cl. 423-447.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Inui, Kanji; Sakamoto, Jun-Ichi; and Gokoh, Yukihiro, 3,932,901.
Yoneno, Hiroshi; and Inami, Akira, 3,933,666.

Matthews, Gordon H.; and Epstein, Barry M., to Action Communication Systems, Inc. Method and system for short term queuing of telephone calls in automatic inter-city telephone call connection system. 3,934,095, Cl. 179-18.00D.

Mattos, Manuel A. Baler wire carton and system. 3,933,087, Cl. 100-1.000.

Matui, Yasushi: *See—*
Machi, Sueo; Matui, Yasushi; Shinano, Takayuki; Aono, Taiji; Hibi, Yoshiharu; Oshima, Shozo; and Kashiki, Masayuki, 3,933,731.

Matvienko, Viktor Yakovlevich: *See—*
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Maurer, Gottfried; Harris, Patrick S.; and Ledder, Wayne H., to Viable Systems, Inc. Event recorder with coded removable display. 3,934,123, Cl. 235-92.0PD.

Maurice, Jacques: *See—*
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, 3,933,992.

Maurice, Jean, to Societe Anonyme Francaise du Ferodo. Disc brake mounting structure. 3,933,226, Cl. 188-72.500.

Mavrovic, Ivo. Process for prilling urea. 3,933,956, Cl. 264-14.000.

Maximovich, Boleslav Ivanovich: *See—*
Dudko, Daniil Andreevich; Samsonov, Grigory Valentinovich; Maximovich, Boleslav Ivanovich; Zelenin, Vitaly Ivanovich; Klimanov, Alexandr Sergeevich; Potseluiko, Vladimir Nikolaevich; Trunov, Gennady Vasilievich; and Sleptsov, Vasily Mikhailovich, 3,933,482.

Maxson, Myron T.: *See—*
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Maxwell, Thomas J.: *See—*
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May & Baker Limited: *See—*
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Caton, Michael Peter Lear; and Parker, Trevor, 3,933,890.

Mayer & Cie.: *See—*
Plath, Ernst Dieter, 3,934,083.

Mayer, Peter; and Schuhmann, Siegfried, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet delivery arrangement having an air-stream sheet retarder. 3,933,351, Cl. 271-183.000.

Mayer, Robert, to Sun Oil Company of Pennsylvania. Pulse flow detector. 3,933,039, Cl. 73-204.000.

Maymarev, Nikolay. Device for electroconductive connection and reading. 3,934,120, Cl. 235-61.11A.

Mazzier, Francesco: *See—*
Gallone, Ermenegildo; and Mazzier, Francesco, 3,933,965.

McAleer, William J.; Spier, Raymond E.; and Posch, Kenneth L., to Merck & Co., Inc. Process for production of vaccines. 3,933,585, Cl. 195-1.100.

McCaskill, John W.: *See—*
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McCombs, Frank Paul: *See—*
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McCord Corporation: *See—*
Rhodes, Richard D., Jr.; and Humphrey, William M., Jr., 3,933,937.
Rhodes, Richard D., Jr.; and Humphrey, William M., Jr., 3,933,938.

McDonald, Bernard. Blood collection device. 3,933,439, Cl. 23-259.000.

McDonnell Douglas Corporation: *See—*
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Wheeler, Mildred S., 3,933,176.

McFarland, James W.: *See—*
Abu-El-Haj, Marwan J.; and McFarland, James W., 3,933,843.

McGhie, Russell Park, to Colgate-Palmolive Company. Captive cap. 3,933,271, Cl. 220-335.000.

McGovern, Terrence P.: *See—*
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McIntosh, Michael D.: *See—*
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McKeehan, Ernest R.; Shawver, Bruce M.; Schiro, Donald J.; and Taft, William E., to United States of America, Energy Research and Development Administration. Control rod drive for reactor shutdown. 3,933,581, Cl. 176-36.00R.

McKenney's, Inc.: *See—*
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McLain, Charles D., to Olin Corporation. Method of making composite metal seals for use in rotary internal combustion engines. 3,933,293, Cl. 228-117.000.

McLaughlin, William L.: *See—*
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McMaster, Lee P., to Union Carbide Corporation. Coagulative recovery of polysulfone resins from solutions thereof. 3,933,764, Cl. 260-79.30M.

Mead Johnson & Company: *See—*
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Medical Laboratory Automation, Inc.: *See—*
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Meekins, John F., to United States of America, Navy. Proportional counter end effects eliminator. 3,934,165, Cl. 313-93.000.

Meenan, Thomas P.: *See—*
Meenan, Vincent D.; and Meenan, Thomas P., 3,933,294.

Meenan, Vincent D.; and Meenan, Thomas P. File folder with a rigid spine. 3,933,294, Cl. 229-1.50R.

Meginnis, George B.: *See—*
Carroll, Charles D.; and Meginnis, George B., 3,933,442.

Mehall, Francis J. Apparatus and method for proving meters. 3,933,027, Cl. 73-3.000.

Meier, Peter, to Credelca A.G. Manufacture of constructional components. 3,933,962, Cl. 264-134.000.

Mellows, Vincent Edward, to Foseco Trading A.G. Refractory heat insulating materials. 3,933,513, Cl. 106-65.000.

Menashi, Wilson P.; Wenckus, Joseph F.; and Castonguay, Roger A., to Arthur D. Little, Inc. Apparatus for direct melt synthesis of compounds containing volatile constituents. 3,933,435, Cl. 23-252.00R.

Mercer, Donald W.; and Horey, Edward C., Jr., to Donbee Corporation. Spinner assembly for board game. 3,933,357, Cl. 273-141.00R.

Merck & Co., Inc.: *See—*
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Zelawski, Zbigniew S.; and Wendler, Norman L., 3,933,901.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
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Merianos, John J.: *See—*
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Meriwether, Lewis Smith: *See—*
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Merrifield, D. Bruce: *See—*
Hopkins, George C.; and Merrifield, D. Bruce, 3,933,740.

Merritt, George A., Jr., to San/Bar Corporation. Telephone message transfer circuit. 3,934,098, Cl. 179-84.00C.

Merrow Machine Company, The: *See—*
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Merz, Herbert: *See—*
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Messerschmitt-Bolkow-Blohm GmbH: *See—*
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Messrs. DEMAG Kunstofftechnik GmbH: *See—*
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Mester, Heinz; and Vogler, Gerd, to U.S. Philips Corporation. Time-measuring device for an X-ray generator. 3,934,146, Cl. 250-402.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Eisenlohr, Karl-Heinz; Scholz, Berthold; and Kapp, Ernest, 3,933,979.

Metcalfe, John Leonard: *See—*
Emmons, Stuart Albert; Metcalfe, John Leonard; and Potts, John Winston, 3,933,274.

Metco, Inc.: *See—*
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Metrailer, William J.: *See—*
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Mettler Instrumente AG: *See—*
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Metzger, Karl Georg: *See—*
Disselnkotter, Hans; and Metzger, Karl Georg, 3,933,795.

Metzner, Irving L.; and O'Connell, Daniel, to Colgate-Palmolive Company. Portable wine dispenser. 3,933,275, Cl. 222-131.000.

Meyer, Andre: *See—*
Henzi, Rene; Meyer, Andre; and Lalanne, Pierre, 3,933,602.

Meyer, Donald R.; and Sill, Arthur D., to Richardson-Merrell Inc. Derivatives of 9-phenanthrene. 3,933,893, Cl. 260-468.500.

Meyer, Georg Michael, to Meyer, Georg Michael. Liquid closure device. 3,933,168, Cl. 137-253.000.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Unsymmetrical esters of N-substituted 1,4-dihydropyridine 3,5-dicarboxylic acid. 3,933,834, Cl. 260-294.80D.

Michaud, Horst; Seeholzer, Josef; Pentzel, Ludwig; and Mangs, Josefa, to Suddeutsche Kalkstickstoff-Werke AG. Melamine, formaldehyde, thiourea and diol ether thermosetting resin and method of preparing the same. 3,933,755, Cl. 260-67.60R.

Michelbrink, Peter Werner. Apparatus for receiving refuse. 3,933,328, Cl. 248-146.000.

Michigan State University: *See—*
Kabara, Jon J., 3,934,029.
Kabara, Jon J., 3,934,030.
Kabara, Jon J., 3,934,031.
Kabara, Jon J., 3,934,035.

Micro Component Technology, Inc.: *See—*
Smith, Nathan R., 3,933,247.

Middelbeek, Cornelis Gerardus, to Frederic R. Harris (Holland) B.V. Oil separator for separating oil lighter than the purified liquid being in a very pure state. 3,933,654, Cl. 210-521.000.

Mieske, Hans-Henning: *See—*
Bleibtreu, Alexander; Breuer, Wolfgang; and Mieske, Hans-Henning, 3,934,174.

Mignano, Frank J. Paper insert feeder. 3,933,350, Cl. 271-10.000.

Mihailovski, Alexander, to Stauffer Chemical Company. Herbicidal compositions. 3,933,468, Cl. 71-95.000.

Mikkelsen, Aase Foght, executrix: *See—*
Mikkelsen, Verner Johannes, deceased, 3,933,103.

Mikkelsen, Verner Johannes, deceased (by Mikkelsen, Aase Foght, executrix), to Aktieselskabet"Volund". Sluice for combustion furnaces as rotary kilns. 3,933,103, Cl. 110-165.00R.

Milkovic, Miran, to General Electric Company. Multi-wire electronic kWh meter. 3,934,198, Cl. 324-142.000.

Miller, Charles Eveleigh: *See—*
Schlatter, Gerald Lance; and Miller, Charles Eveleigh, 3,934,127.

Miller, Jason A.: *See—*
Smerak, Louis J.; and Miller, Jason A., 3,934,040.

Miller, Walter B.: *See—*
Helton, Eugene L.; and Miller, Walter B., 3,932,952.

Milligan, Terry W.; and Wright, Richard F., to Polaroid Corporation. Method and device for determining the concentration of a substance in a fluid. 3,933,594, Cl. 195-103.50R.

Millmaster Onyx Corporation: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,933,812.

Milton, A. Fenner, to United States of America, Navy. Optical connector with single scrambling volume. 3,933,410, Cl. 350-96.00C.

Minaev, Viktor Georgievich: *See—*
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnakov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich, 3,933,574.

Minnesota Mining and Manufacturing Company: *See—*
Busatto, Vinicio; and Franchi, Luigi, 3,933,494.
Coles, Robert F.; and Skoog, Ivan H., 3,933,914.
Schoon, David J., 3,934,136.
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Valentine, Alastair; and Dennison, Richard L., 3,934,209.

Minnick, Robert C.: *See—*
Aiken, Howard H., deceased; Bailey, Paul T.; and Minnick, Robert C., 3,934,236.

Miselem, Abraham C. Means for separation and drainage of liquid from a point between successive stages of steam utilization. 3,933,449, Cl. 55-218.000.

Missale, John V., to Telesonic Systems, Inc. Tour guide system including means for noise and crosstalk suppression. 3,934,202, Cl. 325-54.000.

Mitchell, Howard Lee, III; and Hays, James Richard, to Exxon Research and Engineering Company. Trimetallic hydrocarbon conversion catalyst. 3,933,622, Cl. 208-139.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Hagino, Hiroyasu; Kajiwara, Yasuya; and Nagai, Seiichi, 3,933,541.
Ishibashi, Motochika; Inuzuka, Takahiko; and Maegawa, Tetsuo, 3,933,601.

Mitsubishi Gas Chemical Co., Ltd.: *See—*
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; and Okabe, Masao, 3,933,941.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsubishi Kakoki Kaisha Ltd.: *See—*
Machi, Sueo; Matui, Yasushi; Shinano, Takayuki; Aono, Taiji; Hibi, Yoshiharu; Oshima, Shozo; and Kashiki, Masayuki, 3,933,731.

Mitsubishi Paper Mills, Ltd.: *See—*
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Kosaka, Kenzo; Morioka, Shin; Shibata, Kunio; Goto, Takashi; and Takahashi, Eizi, 3,932,986.

Mitsui Mining & Smelting Co., Ltd.: *See—*
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Mitsui Toatsu Chemicals, Incorporated: *See—*
Hanauye, Kunio; Takase, Tsutomu; Iwasa, Mitsuhiro; and Ito, Mizuo, 3,933,928.

Miwa, Takafumi: *See—*
Ehara, Leo; Miwa, Takafumi; and Kamaya, Masami, 3,933,610.

Mixell, Ronald G., to Ball Corporation. Sealing compounds. 3,933,724, Cl. 260-33.60A.

Miya, Goro: *See—*
Uchida, Youtaro; Miya, Goro; Kobayashi, Kazuo; Oguni, Masayuki; Yoshimura, Tomokazu; Yonemori, Naoteru; and Kameyama, Teruo, 3,933,533.

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Mizoroki, Tsutomu: *See—*
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Mizuguchi, Hidenori: *See—*
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Mizutani, Keiiti; Ogino, Akira; Yamada, Minoru; and Nakagawa, Nobuyuki, to Takeda Chemical Industries, Ltd. Apparatus for continuously making a mixture of viscous material with solid material. 3,932,980, Cl. 53-111.000.

Mizzy Inc.: *See*—
Johnston, Charles, 3,933,155.

Molins, Desmond Walter, to Molins Limited. Manufacture of mouthpiece cigarettes. 3,933,159, Cl. 131-94.000.

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Molkereigenossenschaft Dahlenburg eGmbH: *See*—
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Moller, Wilhelm: *See*—
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; and Rubsam, Franz, 3,933,991.

Molly, Hans. Axial piston type machine. 3,933,082, Cl. 91-485.000.

Momiyama, Iwao; and Fukushima, Tatsuo, to Kansai Paint Company, Ltd. Nonflammable binder composition. 3,933,706, Cl. 260-22.00S.

Monaghan, David A., to United States of America, Interior. Acoustic method and apparatus for determining effectiveness of mine passage seal. 3,934,219, Cl. 340-15.000.

Monarch Marking Systems, Inc.: *See*—
Kirby, Raymond L., Jr., 3,933,092.

Monsanto Company: *See*—
Aiken, Howard H., deceased; Bailey, Paul T.; and Minnick, Robert C., 3,934,236.
Bachman, Gerald L.; Oftedahl, Marvin L.; and Vineyard, Billy D., 3,933,781.
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Moon, Soo-Duck: *See*—
Brill, John B.; Morris, Charles A.; and Moon, Soo-Duck, 3,933,670.

Moore, Alvin Edward. Insubars. 3,932,973, Cl. 52-216.000.

Moore, Anthony John: *See*—
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Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. 2[(1-Cyano-1-methylethyl)azo]-2-methylpropionamide. 3,933,775, Cl. 260-89.100.

Moore, Eugene R.: *See*—
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Moore, Joseph L.: *See*—
Craig, Coba C., Jr., 3,933,222.

Moore, Robert N., to Nicosep Associates. Recovery of zinc and copper from brass scrap. 3,933,478, Cl. 75-101.00R.

Moore, William Percy; and Sansing, James Earl, to Allied Chemical Corporation. High-magnesium ammonium polyphosphate solutions. 3,933,459, Cl. 71-34.000.

Moran, Paul J., to General Electric Company. Parallel interface with high speed printer. 3,934,228, Cl. 340-172.500.

Moreau, Jerry P.; Chance, Leon H.; Boudreaux, Gordon J.; and Drake, George L., Jr., to United States of America, Agriculture. $\alpha\alpha'$-Bis-(phosphono)dicarboxylic acid derivatives. 3,933,944, Cl. 260-932.000.

Moreau, Wayne M.; and Ting, Chiu H., to International Business Machines Corporation. High sensitivity positive resist layers and mask formation process. 3,934,057, Cl. 427-43.000.

Mori, Hideki: *See*—
Akai, Shin-ichi; Mori, Hideki; Takahashi, Nobuo; and Iguchi, Shin-ichi, 3,933,538.

Morioka, Shin: *See*—
Kosaka, Kenzo; Morioka, Shin; Shibata, Kunio; Goto, Takashi; and Takahashi, Eizi, 3,932,986.

Moritani, Nobuo: *See*—
Oguma, Takeshi; Shiba, Shunji; Moritani, Nobuo; and Takeuchi, Yoichi, 3,933,590.

Morris, Charles A.: *See*—
Brill, John B.; Morris, Charles A.; and Moon, Soo-Duck, 3,933,670.

Morris, Earl L.; and Sally, Theodore J., to Acorn Engineering Company. Time-delayed automatic shut-off means for valves. 3,933,337, Cl. 251-54.000.

Morrison, Howard J.; and Nix, Donald F., to Marvin Glass & Associates. Toy vehicle. 3,932,957, Cl. 46-206.000.

Moser, Helmut, to Sandoz Ltd., (Sandoz AG). Substituted 4-(2-benzothiazolyl)phenylazo dyes having a quaternary ammonium, hydrazinium or optionally substituted amino substituent. 3,933,787, Cl. 260-158.000.

Moses, Adolph. Door lock attachment. 3,933,014, Cl. 70-416.000.

Motorola, Inc.: *See*—
Burt, Dan L.; Taraci, Richard F.; and Zavion, John E., 3,934,060.
Grenon, Lawrence A.; and Coleman, Michael G., 3,932,927.
Gunderson, Philip D., 3,933,141.
Rackin, Mark H., 3,933,526.
Rodgers, Michael A., 3,933,985.

Motsinger, Donald L.; Nalley, Charles F.; and Lovelace, Joe B., to PPG Industries, Inc. Forming size of aqueous polyvinylacetate. 3,933,711, Cl. 260-29.6MM.

Moulding, Thomas S. Intrauterine contraceptive device. 3,933,152, Cl. 128-129.000.

Mowrey, William L.: *See*—
Dubin, Robert R.; Will, Fritz G.; and Mowrey, William L., 3,933,523.

Muchowski, Joseph M.; and Iriarte, Jose, to Syntex (U.S.A.) Inc. Obtention of digitoxigenin from neriifolin and 2'-acetylneriifolin. 3,933,791, Cl. 260-210.500.

Mueller, Charles William; Douglas, Edward Curtis; and Wu, Chung Pao, to RCA Corporation. Method of radiation hardening and gettering semiconductor devices. 3,933,530, Cl. 148-1.500.

Mueller, David E.; and Metrailer, William J., to Exxon Research and Engineering Company. Process and apparatus for preventing deposits on a gas inlet nozzle. 3,933,445, Cl. 48-197.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles using a matrix array of liquid-crystal devices. 3,934,242, Cl. 340-324.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles using a plurality of gaseous glow indicator tube means containing an ionizable gas. 3,934,243, Cl. 340-324.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles using fluorescent luminescent alphanumeric indicating means. 3,934,244, Cl. 340-324.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles. 3,934,245, Cl. 340-324.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles using light-emitting diodes (LED's) in conjunction with sets of fiber-optic matrix members. 3,934,246, Cl. 340-324.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles using a matrix array of light-emitting diodes (led's). 3,934,247, Cl. 340-324.00R.

Mueller, Thomas Delbert, to Chevron Research Company. Alphanumeric display means for computer-linked typewriter consoles using a plurality of planar gaseous discharge means within a unitary envelope containing an ionizable gas. 3,934,248, Cl. 340-324.00R.

Mukai, Katsuhiro: *See*—
Kimura, Osamu; Mukai, Katsuhiro; Osada, Minoru; Nara, Shizuo; Tanaka, Yoshitaka; and Yukitomi, Masuo, 3,933,733.

Mulder, Rudolf: *See*—
Wellinga, Kobus; and Mulder, Rudolf, 3,933,908.

Mullen, Patrick E. Article holding and dispensing container. 3,933,245, Cl. 206-498.000.

Muller, Fritz, to Louis Schleiffer AG. Apparatus for the separation of liquid mixtures by means of permeability selective separation membranes. 3,933,647, Cl. 210-346.000.

Muller, Hans Rudolf: *See*—
Bateman, Charles Donald; and Muller, Hans Rudolf, 3,934,221.
Bateman, Charles Donald; Muller, Hans Rudolf; and Brem, Frank Joseph, 3,934,222.

Mummert, John R.: *See*—
Colvin, Floyd E.; Mummert, John R.; and Gilbert, Franklin George, 3,933,643.

Munson, Robert Thomas; and Hodgson, Philip, to Television Research Limited. Variable gain amplifier controlled by ambient noise level. 3,934,084, Cl. 179-1.0VL.

Munson, Robert Thomas; and Hodgson, Philip, to Television Research Limited. Audio amplifier systems. 3,934,085, Cl. 179-1.00P.

Munz, Ferdinand; Hack, Helmuth; and Eue, Ludwig, to Bayer Aktiengesellschaft. Herbicidally active imidazolidin-2-on-1-carboxylic acid amides. 3,933,463, Cl. 71-92.000.

Munzinger, Friedrich. Method of operating a combustion piston engine with external combustion. 3,932,987, Cl. 60-39.050.

Murayama, Keisuke; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayu, to Sankyo Company Limited. 4-Piperidone derivatives, their preparation and their use as stabilizers. 3,933,735, Cl. 260-45.80N.

Murch, Robert M.; and Stahly, Eldon E., to United States of America, Navy. Flame retardant adduct of cyclophosphonitrilic chloride and hexamethylphosphoramide. 3,933,738, Cl. 260-45.9NP.

Murch, Robert Matthews, to W. R. Grace & Co. Fire-resistant intumescent laminates. 3,934,066, Cl. 428-248.000.

Murphy, Charles Vincent: *See*—
Di Giacomo, Armand; Murphy, Charles Vincent; and Pinkney, Paul Swithin, 3,933,703.

Murphy, John Michael. Asset value calculators. 3,933,305, Cl. 235-70.00A.

Murphy, Joseph M.; and Lafler, Robert E., to United States Envelope Company. Substrate having colored indicia thereon for read-out by infrared scanning apparatus. 3,933,094, Cl. 101-426.000.

Murphy, Richard F.; and Chierici, Osvaldo F., to Holland Company. Railroad car uncoupling lever with antifriction slideway arrangement. 3,933,252, Cl. 213-166.000.

Murray, Ian S., to Singer Company, The. Presser device for overedge sewing machines. 3,933,106, Cl. 112-235.000.

Muska, Allen V., to Airco, Inc. Distributing a carbon dioxide slurry. 3,933,001, Cl. 62-47.000.

Muttera, William H., to Dennison-Eastman Corporation. Tag wicket. 3,933,560, Cl. 156-227.000.

Myers, Gary A., to Atlantic Richfield Company. Slurry system for removal of contaminant from synthetic oil. 3,933,624, Cl. 208-253.000.

Naarmann, Herbert; and Pohlemann, Heinz, to BASF Aktiengesellschaft. Polymers containing thioglycol groups. 3,933,765, Cl. 260-79.700.

Nagai, Seiichi: *See—*
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Nagamine, Ryoji: *See—*
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Nagamori, Tomitada: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; and Nagamori, Tomitada, 3,933,736.

Nagano, Ikuo; and Saitoh, Kozo, to Mitsui Mining & Smelting Co., Ltd. Electrical preconditioning in a selective flotation of sulfide ores. 3,933,625, Cl. 209-9.000.

Nagasaka, Kazuo: *See—*
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Nagashima, Shinichiro; and Tsuchiya, Kaichi, to Canon Inc. Organic photoconductive toner materials. 3,933,664, Cl. 252-62.100.

Naiman, Michael I.: *See—*
Heintzelman, William J.; and Naiman, Michael I., 3,933,511.
Heintzelman, William J.; and Naiman, Michael I., 3,933,512.

Naito, Makoto: *See—*
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Naito, Nagayoshi; Hashimoto, Sadakatu; Komuro, Yoshiyuki; Suyama, Tutomu; and Yonekura, Yukio, to Toray Industries, Inc. Hot melt adhesives from lactam copolyamides. 3,933,762, Cl. 260-78.00L.

Nakada, Masahiko; and Kobayashi, Nobuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic choke valve control arrangement for an internal combustion engine. 3,933,307, Cl. 237-12.30B.

Nakagawa, Nobuyuki: *See—*
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Nakamizo, Kozo: *See—*
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Nakao, Masaru: *See—*
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Nakao, Yukimichi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,933,921.

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Nakazawa, Hideaki: *See—*
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Nalco Chemical Company: *See—*
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Nalley, Charles E.: *See—*
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Naono, Toyohiko, to Nihon Denshi Kabushiki Kaisha. Automatic analyzing apparatus. 3,933,436, Cl. 23-253.00R.

Naphtachimie: *See—*
Bailly, Jean Claude; Durand, Daniel; and Mangin, Pierre, 3,933,934.

Nara, Shizuo: *See—*
Kimura, Osamu; Mukai, Katsuhiro; Osada, Minoru; Nara, Shizuo; Tanaka, Yoshitaka; and Yukitomi, Masuo, 3,933,733.

Nardi, Dante; Massarani, Elena; and Degen, Ludwig, to Recordati S.A. Chemical and Pharmaceutical Company. The:apeutically active 2-aminoalkylthio-3H-1.5-benzodiazepines and process for preparing them. 3,933,793, Cl. 260-239.0BD.

Nassry, Asadullah: *See—*
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National Research Development Corporation: *See—*
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Navire Cargo Gear International AB: *See—*
Fagerlund, Per, 3,933,256.

Naylor, Geoffrey, to Ernest Scragg & Sons Limited. Yarn friction false twist device. 3,932,985, Cl. 57-77.400.

Nederman, Bill Peter Philip: *See—*
Stern, Leif E., 3,932,966.

Needles, Howard L.; and Seiber, Rita P., to University of California, The Regents of the. Sensitized vapor phase photo-grafting of monomers onto surfaces. 3,933,607, Cl. 204-159.150.

Neeff, Rutger: *See—*
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 3,933,867.
Thiem, Karl-Werner; Auge, Wolfgang; Neeff, Rutger; and Scheiter, Heinz, 3,933,868.

Nehrich, Richard B., Jr.; and Forbes, David K. Method of identifying enemy forces. 3,934,149, Cl. 250-459.000.

Nelson, Norman A., to Upjohn Company, The. Oxa-phenylene compounds. 3,933,895, Cl. 260-473.00A.

Nelson, Norman A., to Upjohn Company, The. PGF_1 -oxa phenylene compounds. 3,933,896, Cl. 260-473.00A.

Nelson, Norman A., to Upjohn Company, The. PGA_1-oxa-phenylene compounds. 3,933,897, Cl. 260-473.00A.

Nelson, Norman A., to Upjohn Company, The. PGE_1-oxa phenylene compounds. 3,933,898, Cl. 260-473.00A.

Nelson, Norman A., to Upjohn Company, The. PGE_2-oxa-phenylene compounds. 3,933,899, Cl. 260-473.00A.

Nelson, Norman A., to Upjohn Company, The. PGE_3 oxa-phenylene compounds. 3,933,900, Cl. 260-473.00A.

Nelson, Roger P.: *See—*
Hess, Hans-Jurgen E.; and Nelson, Roger P., 3,934,027.

Ness, Philip J.; and Kawada, Barney S. Portable duck blind camp cot and back pack. 3,933,164, Cl. 135-1.00R.

Neu, Hermann: *See—*
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Neuberger, Dan: *See—*
Cameron, Robert G.; and Neuberger, Dan, 3,933,501.

Neumayr, Franz; Fahrbach, Gerhard; and Seiler, Erhard, to BASF Aktiengesellschaft. Modified polymers of diisopropenylbenzene. 3,933,774, Cl. 260-88.200.

Neuwald, Fritz: *See—*
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New Nippon Electric Co., Ltd.: *See—*
Furukawa, Mitsuaki, 3,933,289.

New Products Corporation: *See—*
Von Saspe, Henry Carl, 3,933,091.

Newhouse, Thomas Charles; and Lohr, Thomas Herbert, to Deere & Company. Tensioning device for a flexible drive element. 3,933,055, Cl. 74-242.11S.

Newkirk, John D.: *See—*
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Nibco, Inc.: *See—*
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Nickels, Jack L.: *See—*
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Nicosep Associates: *See—*
Moore, Robert N., 3,933,478.

Nielsen, Peter A.: *See—*
Barrett, Frederick B.; and Nielsen, Peter A., 3,933,390.

Nielsen, Peter Vilhelm, to Danfoss A/S. Air inlet means for air conditioning installations or the like(II). 3,933,306, Cl. 236-49.000.

Nienburg, Hans Juergen; and Kummer, Rudolf, to BASF Aktiengesellschaft. Production of α, ω-dialdehydes. 3,933,920, Cl. 260-604.0HF.

Nifco Inc.: *See—*
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Nigro, Matthew Michael: *See—*
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Nihon Denshi Kabushiki Kaisha: *See—*
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Nihon Spindle Seizo Kabushiki Kaisha: *See—*
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Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, to Ciba-Geigy AG. Phenyl carbamates. 3,933,858, Cl. 260-340.700.

Nikolic, Cvetko B.; Zundel, Weldon P.; and Rickard, Robert S., to Amax Inc. Nickel-cobalt separation. 3,933,975, Cl. 423-139.000.

Nikolic, Cvetko B.; Rickard, Robert S.; and Zundel, Weldon P., to Amax Inc. Nickel-cobalt separation. 3,933,976, Cl. 423-144.000.

Nilsson, Erland; and Lundbohm, Lennart, to Nyby Bruk AB. Long distance heating conduit in particular for hot water lines. 3,933,181, Cl. 138-105.000.

Nilsson, Jan Ove Lennart; and Risberg, Carl Nils Erik, to Stockamollan AB. Fork lift truck. 3,933,224, Cl. 187-9.00R.

Nilsson, Rune; and Jansson, Ake, to United Shoe Machinery Company AB. Combination tool. 3,932,904, Cl. 7-14.10R.

Nilsson, Sven Walter, to AB SKF Nova. Ball bushing. 3,933,396, Cl. 308-6.00C.

Nippon Chemiphar Co., Ltd.: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Steel Corporation: *See—*
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Nishikawa, Takehiko: *See—*
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Nix, Donald F.: *See*—
Morrison, Howard J.; and Nix, Donald F., 3,932,957.

Noel, James S.; Hobbs, John V.; and Webb, Leonard D., to United States of America, Air Force. Hydrostatic stress gauge system. 3,933,034, Cl. 73-88.50R.

Noguchi, Yasuhiro; Ono, Hisatake; and Sugisaki, Tsutomu, to Fuji Photo Film Co., Ltd. Information display method. 3,933,488, Cl. 96-1.00R.

Noguchi, Yasuhiro; Watarai, Syu; Osada, Chiaki; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Photo-polymerizable composition containing an acid salt of an indolinobenzospiropyran. 3,933,509, Cl. 96-115.00P.

Nolin, Roger J., to TRE Corporation. Door lock mechanism. 3,933,016, Cl. 70-149.000.

Noma, Shigeaki: *See*—
Uno, Motohiko; Noma, Shigeaki; Ujiie, Hideo; Masui, Kazuo; and Kanesa, Tadashi, 3,933,137.

Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, to Hitachi, Ltd. Semiconductor circuit devices using insulated gate-type field effect elements having protective diodes. 3,934,159, Cl. 307-304.000.

Nomura, Katsuo: *See*—
Takahata, Yasushi; Karimori, Akira; Kato, Toshiya; and Nomura, Katsuo, 3,933,558.

Nonaka, Masahide: *See*—
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Norby, Thomas E.: *See*—
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Nordson Corporation: *See*—
Tamny, Simon Z., 3,934,055.

Norling, Marshall F. Timer for telephone toll calls and the like. 3,934,240, Cl. 340-309.400.

Norman, John Clark, to Du Pont de Nemours, E. I., and Company. Spinning process. 3,933,963, Cl. 264-170.000.

North Star Research Institute: *See*—
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Norton Company: *See*—
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Nottke, James E., to Du Pont de Nemours, E. I., and Company. Cyanoperfluoroether acid fluorides and copolymers derived therefrom. 3,933,767, Cl. 260-80.760.

Novak, Thomas: *See*—
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Nowak, Robert M.; Guilette, Kenneth J.; and Moore, Eugene R., to Dow Chemical Company, The. Reversible cross-linking of maleic anhydride copolymers. 3,933,747, Cl. 260-47.0UP.

Nozaki, Yasuo: *See*—
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Nuclear Fuel Services, Inc.: *See*—
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Nyby Bruk AB: *See*—
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Oblizajek, Kenneth L.: *See*—
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O'Connell, Daniel: *See*—
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O'Connor, Joseph R.; and Small, Leonard J., to United States of America, Air Force. Method for growing crystals. 3,933,572, Cl. 156-608.000.

Oda, Yoshio; and Suhara, Manabu, to Asahi Glass Co., Ltd. Process for preparing perfluoroalkyl iodides. 3,933,931, Cl. 260-653.000.

Odegaard, Robert J. Spray boom. 3,933,309, Cl. 239-171.000.

Oehlerking, A. Dean; and Stoner, Charles G., to Joy Manufacturing Company. Strain limiting mechanism. 3,933,404, Cl. 339-45.00M.

Oertel, Egon: *See*—
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O'Farrell, James T.: *See*—
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Offermanns, Heribert: *See*—
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Ogata, Masaru: *See*—
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Ogino, Akira: *See*—
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Oguma, Takeshi; Shiba, Shunji; Moritani, Nobuo; and Takeuchi, Yoichi, to Sanyo-Kokusaku Pulp Co., Ltd. Method of continuously culturing yeast. 3,933,590, Cl. 195-91.000.

Oguni, Masayuki: *See*—
Uchida, Youtaro; Miya, Goro; Kobayashi, Kazuo; Oguni, Masayuki; Yoshimura, Tomokazu; Yonemori, Naoteru; and Kameyama, Teruo, 3,933,533.

Ogura, Jiro: *See*—
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Ogura, Masanovu: *See*—
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Ohashi, Takashi: *See*—
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Ohata, Shuichi; Takeuchi, Yoji; and Ishiguro, Takeshi, to Yokogawa Electric Works, Ltd. Apparatus for measuring calorific power of hydrocarbon compounds. 3,934,139, Cl. 250-308.000.

Ohi, Reiichi: *See*—
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Ohi, Yukio: *See*—
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Ohkawa, Masaaki; and Ishii, Koichi, to Sumitomo Chemical Company, Limited. Method relating to manufacture of coumarin derivatives. 3,933,847, Cl. 260-309.200.

Ohkubo, Kinji; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive materials. 3,933,508, Cl. 96-114.100.

Ohlsson, Nils Runol Gustav: *See*—
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Ohsawa, Hisayu: *See*—
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Ohta, Noriyuki: *See*—
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Ohta, Terukazu: *See*—
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Ohyama, Yasushi; and Sumitani, Hideo, to Mitsubishi Paper Mills, Ltd. Amidrazones as dye components and developer scavengers in diffusion transfer materials and processes. 3,933,493, Cl. 96-29.00D.

Oil States Rubber Company: *See*—
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Okabe, Masao: *See*—
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Okamoto, Takanori: *See*—
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Okamoto, Yukio, to Hitachi, Ltd. Flat discharge panel using D.C. discharge, and method of driving the same. 3,934,172, Cl. 315-169.0TV.

Okawara, Makoto: *See*—
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Okuno, Yoshitoshi; Toyoura, Akira; and Higo, Akio, to Sumitomo Chemical Company, Limited. Insecticidal d-cis, trans-chrysanthemates. 3,934,023, Cl. 424-274.000.

Okuno, Zenjiro: *See*—
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Okura Kogya Kabushiki Kaisha: *See*—
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Oler, Ernst Bertil; and Hunnes, Odd Peder, to AB Bofors. Container handling truck. 3,933,218, Cl. 180-79.100.

Olin Corporation: *See*—
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McLain, Charles D., 3,933,293.
Puig, John E.; and Colafati, Ralph A., III, 3,933,701.

Ollis, Murrell W. Alarm for deep freezer. 3,933,120, Cl. 116-103.000.

Olson, John W., Jr., to C & D Valve Manufacturing Company. Apparatus for securing a line tap valve to the exterior of a tubing line. 3,933,170, Cl. 137-318.000.

Olstowski, Franciszek, to Dow Chemical Company, The. Rapid-setting polyurethanes prepared in the presence of a fatty material and an aliphatic liquid hydrocarbon. 3,933,705, Cl. 260-18.0TN.

Olympus Optical Co., Ltd.: *See*—
Tanaka, Syunpei; Nakamizo, Kozo; and Tamagawa, Akira, 3,934,265.

Omietanski, George M.; and Chuang, Vincent T., to Union Carbide Corporation. Hydroxyalkenylsiloxane rigid poly urethane foam stabilizers. 3,933,695, Cl. 260-2.5AH.

Ono, Hiroshi: *See*—
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Ono, Hisatake: *See*—
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Noguchi, Yasuhiro; Watarai, Syu; Osada, Chiaki; and Ono, Hisatake, 3,933,509.

Ono, Shigeo, to Nippon Kogaku K.K. Exposure storage device. 3,934,258, Cl. 354-60.00R.

Onondaga Tool Corporation: *See*—
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Ordway, James F.: *See—*
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Ormsby, George S. Rotating machine wear gauge means. 3,932,941, Cl. 33-181.00R.
Orr, Lavern G.; and Stone, Etric Lee, to TRE Corporation. Method for stretch wrapping of panels. 3,933,020, Cl. 72-297.000.
Orren, Leonard J. Stain resistant anti-perspirant composition. 3,934,004, Cl. 424-68.000.
Osada, Chiaki: *See—*
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Osada, Minoru: *See—*
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Osberghaus, Rainer; and Stein, Werner, to Henkel & Cie GmbH. Process for the manufacture of vicinal glycols. 3,933,923, Cl. 260-615.00R.
Oshima, Shozo: *See—*
Machi, Sueo; Matui, Yasushi; Shinano, Takayuki; Aono, Taiji; Hibi, Yoshiharu; Oshima, Shozo; and Kashiki, Masayuki, 3,933,731.
Ostberg, Jan-Erik. Fluid handling and separating. 3,933,637, Cl. 210-83.000.
Ostrowski, Stanislaw. Helicopter with opposite rotating torque cancelling horizontal propeller. 3,933,324, Cl. 244-17.230.
Otani, Syuichi: *See—*
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Otsuki, Akira, to Alps Electric Co., Ltd. TV channel number indicator. 3,933,121, Cl. 116-124.20R.
Ottawa Silica Company: *See—*
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Otto, Alfred; and Zeuner, Hans, to Bergische Stahl-Industrie. Brake disk construction. 3,933,228, Cl. 188-218.0XL.
Otuka, Sigeharu: *See—*
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Ouchi, Shunji: *See—*
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Packer, Herbert: *See—*
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Packham, Charles C.; Parsonage, Raymond G.; and Underwood, Donald L., to Gillette Company, The. Heating and dispensing apparatus. 3,933,276, Cl. 222-146.0HE.
Pagel, Paul V.: *See—*
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Pagella, Elio; and Guerci, Carlo, to Ing. C. Olivetti & C., S.p.A. Grinding machine. 3,932,961, Cl. 51-165.800.
Pain, David Lord: *See—*
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Pall Corporation: *See—*
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Pall, David B., to Pall Corporation. Continuous production of nonwoven webs from thermoplastic fibers and products. 3,933,557, Cl. 156-167.000.
Palmer, Nigel Innes; and Sugarman, Nathan, to W. R. Grace & Co. Battery separator manufacturing process. 3,933,525, Cl. 136-146.000.
Palmer, Richard Claxton, to RCA Corporation. Video disc recording apparatus and methods. 3,934,263, Cl. 358-4.000.
Palsson, Jan F.: *See—*
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Pampus, Gottfried; Lehnert, Gunther; and Witte, Josef, to Bayer Aktiengesellschaft. Process for the polymerisation of cyclooctadiene. 3,933,778, Cl. 260-93.100.
Panis, Constantius Johannes Waltherus: *See—*
Groothoff, Adriaan Jacob; van der Heijde, Martin Clemens; Van Leeuwen, Johannes Aloysius; and Panis, Constantius Johannes Waltherus, 3,934,169.
Pappas, Nicholas J.: *See—*
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Paprocki, Kazimierz. Solid state flyback transformer checker. 3,934,194, Cl. 324-51.000.
Park, Kwansub: *See—*
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Parker Drilling Company, Inc.: *See—*
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Parker, Trevor: *See—*
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Parsonage, Raymond G.: *See—*
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Parthasarathy, R., to W. R. Grace & Co. Methanation catalyst and process of use. 3,933,883, Cl. 260-449.00M.
Partridge, John Joseph, Jr.: *See—*
Chadha, Naresh Kumar; Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 3,933,892.
Pasini, Arnaldo, to Ing. C. Olivetti & C., S.p.A. Non-impact printer. 3,934,257, Cl. 354-5.000.
Pasini, Joseph, III; Overbey, William K., Jr.; and Komar, Charles A., to United States of America, Energy Research and Development Administration. Underground gasification of coal. 3,933,447, Cl. 48-210.000.
Paskert, Joseph H., to Eaton Corporation. Releasably attachable clip. 3,932,918, Cl. 24-260.000.
Pasqualucci, Carmine; Scarpitta, Giuseppe; and Bonfanti, Giovanni, to Archifar Industrie Chimiche Del Trentino S.p.A. Process for preparing rifamycin S by hydrolysis of rifamycin O. 3,933,801, Cl. 260-239.30P.
Patel, Jitendra A.: *See—*
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Patsch, Manfred: *See—*
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Patterson, Charles A., Jr.; and Tolnar, Emil J., Jr., to General Motors Corporation. Electrical connector with deflectable butt contact terminal. 3,933,405, Cl. 339-48.000.
Pattison, Victor A.: *See—*
Eastman, David W.; Lemper, Anthony L.; Pattison, Victor A.; Hopkins, George C.; Kahn, Henry; and Nickels, Jack L., 3,933,771.
Patton, Colonel E., to Blue Ember Flame Corporation. Gas generation apparatuses and processes. 3,933,618, Cl. 208-8.000.
Patton, Tad L., to Exxon Research and Engineering Company. Iminoimidazolidinedione and parabanic acid polymers containing imide groups. 3,933,758, Cl. 260-77.5CH.
Pavlou, George S., to Ambac Industries, Inc. Differential pressure visual and audible warning signal device for hydraulic and pneumatic systems. 3,934,238, Cl. 340-239.00F.
PCR, Inc.: *See—*
De Pasquale, Ralph J.; and Baucom, Keith B., 3,933,831.
Pearce, Donald. Simulated tennis game. 3,933,355, Cl. 273-85.00R.
Pecar, Milan. System for producing work using a small temperature differential. 3,932,995, Cl. 60-531.000.
Peck, William H.: *See—*
Adams, James S.; Foster, Leslie Dale; and Peck, William H., 3,932,903.
Pegel, Karl Heinrich, to Liebenberg, Roelof Wilke. Extraction of sterolins from plant material. 3,933,789, Cl. 260-210.500.
Pehrsson, Matz: *See—*
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Peltz, John Robert, to GTE Sylvania Incorporated. Method for manufacturing bimetallic members having snap action characteristics. 3,933,022, Cl. 72-342.000.
Pennwalt Corporation: *See—*
Burns, Charles Francis, 3,933,961.
Toukan, Sameeh Said; and Hauptschein, Murray, 3,933,819.
Penque, Ronald A. Process of sonically treating municipal waste to produce high quality paper pulp and fertilizer. 3,933,577, Cl. 162-4.000.
Pentzel, Ludwig: *See—*
Michaud, Horst; Seeholzer, Josef; Pentzel, Ludwig; and Mangs, Josefa, 3,933,755.

PEPRO, Societe pour le Development et la Vente de Specialites: *See*—
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Pera, John D.: *See*—
Buckman, Stanley J.; Fenyes, Joseph G. E.; Flanagan, Kenneth J.; Pera, John D.; and Pulido, Miguel L., 3,933,472.

Percevaut, Emile Henri Gabriel. Purifier for the physical-chemical treatment of combustion gases and other gases containing polluting or noxious constituents. 3,933,450, Cl. 55-223.000.

Permutit Company, Inc., The: *See*—
Adams, Ralph C., 3,933,631.

Perron, James S.: *See*—
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Perschy, James A., to United States of America, Navy. Output controller for initiating delayed or conditional commands via a general purpose computer. 3,934,131, Cl. 235-153.00A.

Pessagno, Mary A., to Raymond Lee Organization, Inc., The, a part interest. Newspaper and magazine storage device. 3,933,088, Cl. 100-34.000.

Peter, Richard; and Angliker, Hans-Joerg, to Ciba-Geigy AG. Heterocyclic-azo-phenyl compounds containing a styrl group. 3,933,786, Cl. 260-156.000.

Peters, Gugo Borisovich: *See*—
Zalesov, Oleg Alexandrovich; Lomakin, Mikhail Sergeevich; Merkulov, Vadim Nikolaevich; Pevzner, Leonid Davidovich; Peters, Gugo Borisovich; Potapov, Vladimir Dmitrievich; Rzhevsky, Vladimir Vasilievich; Tolpezhnikov, Lev Ivanovich; Yarizov, Anatoly Danilovich; Mamkin, Viktor Modestovich; Raskin, Veniamin Lvovich; Satovsky, Boris Ivanovich; and Yartsev, Grigory Matveevich, 3,934,126.

Peterson, Earl C., to Electrolysis Pollution Control Inc. Removal of immiscible fluids from water surfaces and lake beds. 3,933,632, Cl. 210-36.000.

Peterson, Gerald H. Method and apparatus for electric singe cutting. 3,934,115, Cl. 219-223.000.

Peterson, Roy E., to Elco Industries, Inc. Self-drilling fastener and method of making same. 3,933,075, Cl. 85-41.000.

Peterson, Warren J., to Joerns Furniture Company. Drawer with removable front panel. 3,933,402, Cl. 312-330.000.

Petrocci, Alfonso N.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,933,812.

Petrolite Corporation: *See*—
Heintzelman, William J.; and Naiman, Michael I., 3,933,511.
Heintzelman, William J.; and Naiman, Michael I., 3,933,512.

Petrovich, Paul: *See*—
Sekmakas, Kazys; and Petrovich, Paul, 3,933,760.

Petrow, Henry G.; and Allen, Robert J., to Prototech Company. Method of forming palladium oxide and palladium particles. 3,933,684, Cl. 252-447.000.

Pettersen, Aage; and Schulkind, Herbert, to Corning Glass Works. Automatic calibration system. 3,934,197, Cl. 324-130.000.

Petukhov, Sergei Timofeevich: *See*—
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnakov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich, 3,933,574.

Pevzner, Leonid Davidovich: *See*—
Zalesov, Oleg Alexandrovich; Lomakin, Mikhail Sergeevich; Merkulov, Vadim Nikolaevich; Pevzner, Leonid Davidovich; Peters, Gugo Borisovich; Potapov, Vladimir Dmitrievich; Rzhevsky, Vladimir Vasilievich; Tolpezhnikov, Lev Ivanovich; Yarizov, Anatoly Danilovich; Mamkin, Viktor Modestovich; Raskin, Veniamin Lvovich; Satovsky, Boris Ivanovich; and Yartsev, Grigory Matveevich, 3,934,126.

Pfizer Inc.: *See*—
Abu-El-Haj, Marwan J.; and McFarland, James W., 3,933,843.
Barth, Wayne E.; and Kuhla, Donald E., 3,933,830.
Hamanaka, Ernest S., 3,933,797.
Hess, Hans-Jurgen E.; and Nelson, Roger P., 3,934,027.

Pflugmacher, Jochen: *See*—
Ebing, Winfried; and Pflugmacher, Jochen, 3,933,437.

Philipp, Warren H. Method of making a rigid unitary fertilizer composite. 3,933,458, Cl. 71-27.000.

Phillipps, Gordon Hanley, to Glaxo Laboratories Limited. 11β-Halo-9,12-unsubstituted-C_{19}-steroids. 3,933,799, Cl. 260-239.55R.

Phillips Petroleum Company: *See*—
Bertus, Brent J., 3,933,933.
Kinney, Alfred W., 3,932,978.
Mathis, Ronald D.; Underwood, John H.; and Dix, James S., 3,933,707.

Phillips, William; and Staebler, David Lloyd, to RCA Corporation. Photochromic lithium niobate and method for preparing same. 3,933,504, Cl. 96-88.000.

Pierret, James A., to Fansteel Inc. Tantalum anode for electrolytic devices. 3,934,179, Cl. 317-230.000.

Pignocco, Arthur J.: *See*—
Adams, Richard C.; Kachik, Robert H.; Pignocco, Arthur J.; and Rall, Waldo, 3,933,191.

Pike, John E.; and Schneider, William P., to Upjohn Company, The. 11β,15β-PGF_2 compounds. 3,933,891, Cl. 260-468.00D.

Pillsbury Company, The: *See*—
Reid, Francis R.; and Leezer, James R., 3,933,302.
Rejsa, Jack J., 3,933,068.
Rejsa, Jack J., 3,933,085.
Standing, Charles N., 3,933,086.

Pincemin, Marcel: *See*—
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Pinkney, Paul Swithin: *See*—
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Pinter, Ladislaus: *See*—
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,933,858.

Plastic Forming Company, Inc., The: *See*—
Schurman, Peter T., 3,933,243.
Schurman, Peter T., 3,933,381.

Plath, Ernst Dieter, to Mayer & Cie. Method and apparatus for processing the information content of a pattern drawing in coded form. 3,934,083, Cl. 178-6.60R.

Platz, Winfried; Bar, Ulrich; and Schmidt, Martin, to Siemens Aktiengesellschaft. Patient support with weight-sensitive spring scale for controlling motor operation. 3,934,147, Cl. 250-445.000.

Plempel, Manfred: *See*—
Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 3,934,014.

Ploeg, Hermanus L., to Du Pont de Nemours, E. I., and Company. Trifluoromethyl triazines. 3,933,815, Cl. 260-248.0NS.

Plumb, Rex V., to Fruehauf Corporation. Bulk cargo unloader aerator. 3,933,280, Cl. 222-193.000.

Poclain: *See*—
Cresp, Michel M., 3,933,262.
Martin, Louis E., 3,932,992.

Pohlemann, Heinz: *See*—
Naarmann, Herbert; and Pohlemann, Heinz, 3,933,765.

Pohler, Carl-Ludwig: *See*—
Fangmeier, Ralf; and Pohler, Carl-Ludwig, 3,933,018.

Poignant, Pierre; Thellot, Bernard; and Rognon, Jacques, to PEPRO, Societe pour le Development et la Vente de Specialites. Compositions for controlling weeds. 3,933,471, Cl. 71-120.000.

Polaroid Corporation: *See*—
Chiang, Yunn H., 3,933,854.
Curtis, Harris L.; and Foley, James W., 3,933,798.
Downey, Rogers B., 3,933,555.
Huyffer, Paul S., 3,933,849.
Milligan, Terry W.; and Wright, Richard F., 3,933,594.

Polgar, Livia: *See*—
Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, 3,933,579.

Polinsky, Murray Arthur, to RCA Corporation. Method of vapor deposition. 3,934,059, Cl. 427-90.000.

Pollastri, Livio; and Tessarolo, Franco, to Industrie A. Zanussi S.p.A. Apparatus for preparing beverages. 3,933,639, Cl. 210-149.000.

Poly-San Corporation: *See*—
Harding, George W., 3,932,925.

Polysius AG: *See*—
Klein, Hans; Balzau, Gerhard; and Luffargue, Jacquy-Pierre, 3,933,394.

Pongracz, Frank Istvan: *See*—
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Ponsen, Gijsbert Johannes; and Witteman, Wilhelmus Jacobus, to U.S. Philips Corporation. Gaseous electric discharge tube having a coaxial, hollow cathode structure. 3,934,167, Cl. 313-185.000.

Pontigny, Jacques. Separable coupling between two tubes and its production process. 3,933,379, Cl. 285-381.000.

Poole, Forrest R.: *See*—
Kaplan, Burton H.; Poole, Forrest R.; and Flagg, John E., 3,933,150.

Popeil Brothers, Inc.: *See*—
Popeil, Samuel Joseph, 3,933,315.

Popeil, Samuel Joseph, to Popeil Brothers, Inc. Food chopper & cutting surface. 3,933,315, Cl. 241-166.000.

Portalier, Pierre Louis, to Societe Nationale des Poudres et Explosifs. Solid cylindrical centripetally burning propellant with four convex arced lobes. 3,933,098, Cl. 102-99.000.

Posch, Kenneth L.: *See*—
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Potapov, Vladimir Dmitrievich: *See*—
Zalesov, Oleg Alexandrovich; Lomakin, Mikhail Sergeevich; Merkulov, Vadim Nikolaevich; Pevzner, Leonid Davidovich; Peters, Gugo Borisovich; Potapov, Vladimir Dmitrievich; Rzhevsky, Vladimir Vasilievich; Tolpezhnikov, Lev Ivanovich; Yarizov, Anatoly Danilovich; Mamkin, Viktor Modestovich; Raskin, Veniamin Lvovich; Satovsky, Boris Ivanovich; and Yartsev, Grigory Matveevich, 3,934,126.

Potseluiko, Vladimir Nikolaevich: *See*—
Dudko, Daniil Andreevich; Samsonov, Grigory Valentinovich; Maximovich, Boleslav Ivanovich; Zelenin, Vitaly Ivanovich; Klimanov, Alexandr Sergeevich; Potseluiko, Vladimir Nikolaevich; Trunov, Gennady Vasilievich; and Sleptsov, Vasily Mikhailovich, 3,933,482.

Pottken, Wolfgang: *See*—
Harmsen, Ulf O.; Pottken, Wolfgang; and Oertel, Egon, 3,932,936.

Pottken, Wolfgang S.: *See*—
Harmsen, Ulf O.; and Pottken, Wolfgang S., 3,932,935.

Potts, John Winston: *See*—
Emmons, Stuart Albert; Metcalfe, John Leonard; and Potts, John Winston, 3,933,274.

Poulsen, Boyd J., to Syntex (U.S.A.) Inc. Pharmaceutical composition. 3,934,013, Cl. 424-239.000.

Powell, James E., to Shell Oil Company. 2-(Dihalonitromethyl)-5,6-dihydro-4H-1,3-thiazines. 3,933,809, Cl. 260-243.00R.

Powermatic/Houdaille, Inc.: *See—*
Boles, Charles L.; and Flanigan, Richard J., 3,933,189.

Poznyak, Ilya Yakovlevich: *See—*
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnakov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich, 3,933,574.

PPG Industries, Inc.: *See—*
Anderson, Carl C.; and Dowbenko, Rostyslaw, 3,933,940.
Motsinger, Donald L.; Nalley, Charles E.; and Lovelace, Joe B., 3,933,711.
Shumaker, Lyle L., 3,933,552.

Prag, Rudolf, to Siemens Aktiengesellschaft Detector for ionizing radiation. 3,934,143, Cl. 250-370.000.

Pratt, Ivor; and Boschert, Ulrich, to SCM Corporation. Dicyclopentadiene thermosetting polyester. 3,933,757, Cl. 260-75.00A.

Preco Corporation: *See—*
Walters, Wally Z., 3,933,489.

Prick von Wely, Francois: *See—*
Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; Prick von Wely, Francois; and Winzentsen, Uwe, 3,933,349.

Pries, Erich E., to Dr. C. Otto & Comp. G.m.b.H. Coke oven door. 3,933,598, Cl. 202-248.000.

Priest, David C.; and Brandien, John E., deceased (by Brandien, Helen, executrix), to Reeves Brothers Inc. Production of flame retardant flexible polyurethane foams. 3,933,693, Cl. 260-2.5AJ.

Printz, Gerhard; and Haase, Ralf, to Semperit Aktiengesellschaft. Method and apparatus for butt connection of plies formed of plastic deformable material, especially rubberized steel cord plies. 3,933,565, Cl. 156-266.000.

Procter & Gamble Company, The: *See—*
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Prototech Company: *See—*
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Pugsley, Kenneth N. Carton structure and blank therefor. 3,933,301, Cl. 229-41.00B.

Puig, John E.; and Colafati, Ralph A., III, to Olin Corporation. High resilience polyurethane foam. 3,933,701, Cl. 260-2.5AT.

Pulido, Miguel L.: *See—*
Buckman, Stanley J.; Fenyes, Joseph G. E.; Flanagan, Kenneth J.; Pera, John D.; and Pulido, Miguel L., 3,933,472.

Pullman Incorporated: *See—*
Schuller, James J.; and Marsh, Ronald W., 3,933,384.

Puls, Walter: *See—*
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Pulver, Willis C.; and Heide, Henry A., to Velten & Pulver, Inc. Stacker-unstacker. 3,933,254, Cl. 214-6.0DS.

Purdue Research Foundation: *See—*
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Pusch, Gunter: *See—*
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Quentin, Jean Pierre: *See—*
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Quepar S.A.: *See—*
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R. A. Jones & Co. Inc.: *See—*
Hughes, Charles C., 3,932,983.

Rabenecker, Horst; and Spahrbier, Horst, to Dragerwerk Aktiengesellschaft. Gas detector with automatically operable fan switch. 3,933,029, Cl. 73-23.000.

Rackin, Mark H., to Motorola, Inc. Housing for battery cell with protection for pressure and temperature. 3,933,526, Cl. 136-166.000.

Radiochemical Centre Limited, The: *See—*
Charlton, John Cecil; and Gravett, David Lawrence, 3,933,996.

Radt, Walter: *See—*
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Ragen Precision Industries, Inc.: *See—*
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Rall, Waldo: *See—*
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Ram Domestic Products Company: *See—*
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Randmere, Uno; and Halbig, Walter A., to Stromberg-Carlson Corporation. Control circuit for subscriber station in video telephone system. 3,933,233, Cl. 179-2.0TV.

Raoul, Pierre: *See—*
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Rausing, Hans A.: *See—*
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Rawlings, Robert K., to U.S. Reduction Co. Method and apparatus for melting metals. 3,933,343, Cl. 266-16.000.

Ray, Neil Hunter; Shaw, Bryan; and Lane, Bruce Cochran, to Imperial Chemical Industries Limited. Fire retardant compositions. 3,933,689, Cl. 260-2.5FP.

Raymond Lee Organization, Inc., The: *See—*
Bitgood, Andrew J.; and Bellavance, Roger T., 3,932,908.
Brcic, Ivo, 3,934,217.
Pessagno, Mary A., 3,933,088.

Raytheon Company: *See—*
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Helgeson, Peter L., 3,933,400.
MacMaster, George H.; and Dudley, Kenneth W., 3,934,106.

Razdan, Raj Kumar; and Pars, Harry George, to Sharps Associates. Method of producing analgesia and compositions useful therein. 3,934,024, Cl. 424-275.000.

RCA Corporation: *See—*
Channin, Donald Jones, 3,934,199.
Kiess, Helmut Gustav; and Rose, Albert, 3,934,180.
Mueller, Charles William; Douglas, Edward Curtis; and Wu, Chung Pao, 3,933,530.
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Reamco, Inc.: *See—*
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Recordati S.A. Chemical and Pharmaceutical Company: *See—*
Nardi, Dante; Massarani, Elena; and Degen, Ludwig, 3,933,793.

Rector, Norwood H.; and Fredericks, Rodney G., to United States of America, Navy. Water level gauge. 3,933,042, Cl. 73-304.00C.

Redactron Corporation: *See—*
Marino, Francis C., 3,934,088.

Reed, Robert D.: *See—*
Zink, John S.; Schwartz, Robert E.; and Reed, Robert D., 3,933,420.

Reese, Burkhart; and Schick, Lothar, to Boge GmbH. Process or method of producing a small opening in a relatively thick metallic or pipe wall. 3,933,021, Cl. 72-327.000.

Reeves Brothers Inc.: *See—*
Priest, David C.; and Brandien, John E., deceased, 3,933,693.

Reflex Corporation of Canada Limited: *See—*
Hedgewick, Peter; and Birrell, Stewart H., 3,933,119.

Regel, Erik: *See—*
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Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 3,934,014.

Reger, David William; and Nigro, Matthew Michael, to American Cyanamid Company. Preparation of aromatic 2-imino-1,3-dithietanes. 3,933,851, Cl. 260-327.00M.

Reich, Harry. Recirculating barbeque device. 3,933,145, Cl. 126-25.00R.

Reick, Franklin G., to Ebert, Michael, a part interest. Lubricating oil with fluorocarbon additive. 3,933,656, Cl. 252-25.000.

Reid, Francis R.; and Leezer, James R., to Pillsbury Company, The. Cylindrical fiber container with display label. 3,933,302, Cl. 229-51.0BP.

Reilly, Joseph R.; and Sincock, Thomas F., to Monsanto Company. Apparatus for forming multiaxially oriented containers. 3,933,417, Cl. 425-326.00B.

Reimann, Otto: *See—*
Ettenreich, Ludwig; Reimann, Otto; and Greulich, Klaus, 3,933,534.

Reinert, Guido Georg. Microscope-illuminating system. 3,933,408, Cl. 350-87.000.

Reininghaus, Ulrich: *See—*
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Rejsa, Jack J., to Pillsbury Company, The. Trim removal belt for dough cutting apparatus. 3,933,068, Cl. 83-168.000.

Rejsa, Jack J., to Pillsbury Company, The. Potato coring machine. 3,933,085, Cl. 99-544.000.

Rentz, Robert G.: *See—*
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REPA GmbH Feinstanzwerk: *See—*
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Republic Steel Corporation: *See—*
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Research Corporation: *See—*
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Resource Products, Inc.: *See—*
Jones, Roy D., 3,933,316.
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Reynolds Metals Company: *See—*
Hinrichs, Donald R., 3,933,958.
Kirby, Thomas E., Jr., 3,933,303.
Rhodes, Richard D., Jr.; and Humphrey, William M., Jr., to McCord Corporation. Molding-grade polyurethane. 3,933,937, Cl. 260-859.00R.
Rhodes, Richard D., Jr.; and Humphrey, William M., Jr., to McCord Corporation. Grafted polyether diol-based thermoplastic urethane elastomer. 3,933,938, Cl. 260-859.00R.
Rhone-Poulenc S.A.: *See—*
Bargain, Michel; and Ducloux, Maurice, 3,933,745.
Brunet, Jean-Paul; and Cometti, Andre, 3,933,905.
Colovray, Gilbert, 3,933,929.
Kuntz, Emile; and Quentin, Jean Pierre, 3,933,753.
Letoffe, Michel, 3,933,729.
Rhone-Progil: *See—*
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Helgorsky, Jacques; and Auroy, Michel, 3,933,630.
Ledoux, Claude; Raoul, Pierre; and Thomas, Jean-Claude, 3,933,124.
Riccitelli, James A. Electronic security card and system for authenticating card ownership. 3,934,122, Cl. 235-61.70B.
Rich, Donald S.; and Rudnick, Norman, to Inflo Systems, Inc. Switch mechanisms. 3,934,215, Cl. 335-207.000.
Richard, Roger R.: *See—*
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Richardson-Merrell Inc.: *See—*
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Richey, Danny D.: *See—*
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Rickard, Robert S.: *See—*
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Ricoh Co., Ltd.: *See—*
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Riedhammer, Josef, to Hydromatik GmbH. Control apparatus for an adjustable hydraulic machine driven by an adjustable driving motor. 3,932,993, Cl. 60-431.000.
Riggi, Giovanni. Cooling apparatus particularly for medical-surgical use. 3,933,156, Cl. 128-303.100.
Ringler, Lloyd H. Ball inflating apparatus and method. 3,932,977, Cl. 53-7.000.
Ringwall, Carl Gustave, to General Electric Company. Closed loop fluidic angular rate gyro. 3,933,051, Cl. 74-5.60B.
Ringwood, Robert C., Jr.: *See—*
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Riniker, Bernhard: *See—*
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Ritter, Glenn Richard: *See—*
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Robbins, Kenneth W.: *See—*
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Roberson, Cletis L., to Owens-Corning Fiberglas Corporation. Apparatus for packaging glass fibers. 3,933,456, Cl. 65-11.00W.
Robert Bosch G.m.b.H.: *See—*
Holl, Walter; and Scholpp, Martin, 3,933,687.
Roberts, Alvin M.; and Roberts, Kenneth E. Guy crane jib tip prop. 3,933,250, Cl. 212-58.00R.
Roberts, Kenneth E.: *See—*
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Robinson, Dorian Dodge: *See—*
Dodge, Adiel Y., deceased; and Crocker, Dorian Dodge, executrix, 3,933,600.
Robinson, Frank R.; and Robinson, Frank S. Hollow reinforced concrete fence post and method and apparatus for making the same. 3,933,969, Cl. 264-312.000.
Robinson, Frank S.: *See—*
Robinson, Frank R.; and Robinson, Frank S., 3,933,969.
Roch, Roger Henri, to J. Bobst & Fils S.A. Installation for continuous measurement of the elastic coefficient of a traveling strip, wire or ribbon. 3,933,035, Cl. 73-95.500.
Rockwell International Corporation: *See—*
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Rodenchuk, William Simon; and Eccles, Anthony Garth, to Alcan Research and Development Limited. Semi-continuous casting method for flat ingots. 3,933,192, Cl. 164-89.000.
Rodgers, Michael A., to Motorola, Inc. Process for production of polycrystalline silicon. 3,933,985, Cl. 423-350.000.
Roesler, Gordon M.: *See—*
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Rohm and Haas Company: *See—*
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Romanelli, Pat, to Ram Domestic Products Company. Magnetically-controlled gas ignition system. 3,933,419, Cl. 431-66.000.
Roscoe, William A. Reed container. 3,933,242, Cl. 206-314.000.
Rose, Albert: *See—*
Kiess, Helmut Gustav; and Rose, Albert, 3,934,180.
Roselli, Sergio; and Sauer, Gerd, to Saint-Gobain Industries. Apparatus for heating a window. 3,934,111, Cl. 219-203.000.
Rosen, Herbert J., to Hooker Chemicals & Plastics Corporation. Method of simultaneously producing chlorine dioxide and a sulfate salt. 3,933,988, Cl. 423-480.000.
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Rosenthal, Ben J. Solid state light responsive control system. 3,934,181, Cl. 318-53.000.
Rosenthal, Herman A.: *See—*
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Rosette, King H.; and Packer, Herbert, to Harshaw Chemical Company, The. Shaped press-forged normally frangible inorganic crystals. 3,933,970, Cl. 264-320.000.
Ross, Gerald F.; and Robbins, Kenneth W., to Sperry Rand Corporation. Closed loop tunnel diode receiver for operation with a base band semiconductor transmitter. 3,934,252, Cl. 343-7.0VM.
Rossi, Alberto: *See—*
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Rossi, Anthony T., to Tropicana Products, Inc. Container and cap with tear strip. 3,933,264, Cl. 215-254.000.
Rossler, Erich: *See—*
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Rossman, Rudolph J. Stair construction. 3,932,972, Cl. 52-183.000.
Rotterman, Robert. Conveyor for a transit warehouse for parcelled cargo to be stored, particularly for goods transported on pallets. 3,933,237, Cl. 198-37.000.
Rounds, Gerald L., to Kaiser Steel Corporation. Process for desulfurizing gases. 3,933,994, Cl. 423-575.000.
Roux, Claude Paul; and Torossian, Dieran Robert, to Jouveinal, S.A. Pharmaceutical preparation for percutaneous treatment of local edemas. 3,934,016, Cl. 424-270.000.
Rovere, Virgilio. Grinding mill. 3,933,317, Cl. 241-246.000.
Rubesamen, Erich; and Wehling, Karl. Adaptor for feeding current to electrical contact rails. 3,933,403, Cl. 339-22.00R.
Rubsam, Franz: *See—*
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Ruegg, Martin: *See—*
Haas, Georges; Jaques, Roland; Rossi, Alberto; and Ruegg, Martin, 3,933,835.
Rushton, William E., to Whiting Corporation. Evaporation of radioactive wastes. 3,933,576, Cl. 159-27.00A.
Ruskin, Bryan Ernest Sydney; and Webber, Peter James, to Lunch Locker Systems Limited. Packaging containers. 3,933,296, Cl. 229-2.500.
Russum, Leonard W.; and Hoekstra, Gerald B., to Standard Oil Company. Process for hydroprocessing heavy hydrocarbon feedstocks in a pipe reactor. 3,933,620, Cl. 208-108.000.
Rzhevsky, Vladimir Vasilievich: *See—*
Zalesov, Oleg Alexandrovich; Lomakin, Mikhail Sergeevich; Merkulov, Vadim Nikolaevich; Pevzner, Leonid Davidovich; Peters, Gugo Borisovich; Potapov, Vladimir Dmitrievich; Rzhevsky, Vladimir Vasilievich; Tolpezhnikov, Lev Ivanovich; Yarizov, Anatoly Danilovich; Mamkin, Viktor Modestovich; Raskin, Ve-

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Sachleben, Harold Gerard, Sr.; Montgomery, Everett Gray; Forman, Clarence Albert; Carr, Robert David; Cary, Lawrence Edward; Boggs, Beryl Aaron; Burnley, Harold George, Jr.; and Chafer, Alistair James, to Allied Chemical Corporation. Vertical spindle winder. 3,933,319, Cl. 242-18.00R.

Sackinger, James P.: *See*—
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Saito, Masumi: *See*—
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Saitoh, Kozo; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separating vinyl chloride. 3,933,633, Cl. 210-44.000.

Saitoh, Kozo: *See*—
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Sakaguchi, Yasuo: *See*—
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Sakuma, Kenichi; and Tanahashi, Ryozi, to Nippon Gakki Seizo Kabushiki Kaisha. Ski having a hollow core. 3,933,362, Cl. 280-11.13L.

Salemme, Robert M., to General Electric Company. Use of concentrated chelated iron reagent for reducing pollutant content of a fluid. 3,933,993, Cl. 423-573.000.

Salera, Edmond A.; and Salera, Edmond E. Anisothermal differentiator. 3,933,149, Cl. 128-2.00H.

Salera, Edmond E.: *See*—
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Salle, Yves; and Pincemin, Marcel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Automatic selector for peripheral equipment. 3,934,230, Cl. 340-172.500.

Salloum, Robert J.; and Hodges, Raymond H., to General Motors Corporation. Thermoformed plastic energy absorber for vehicles. 3,933,387, Cl. 293-71.00R.

Sally, Theodore J.: *See*—
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Salter, David Anthony; and Simkins, Robert John James. Preparation of nitrophenols. 3,933,926, Cl. 260-622.00P.

Samsonov, Grigory Valentinovich: *See*—
Dudko, Daniil Andreevich; Samsonov, Grigory Valentinovich; Maximovich, Boleslav Ivanovich; Zelenin, Vitaly Ivanovich; Klimanov, Alexandr Sergeevich; Potseluiko, Vladimir Nikolaevich; Trunov, Gennady Vasilievich; and Sleptsov, Vasily Mikhailovich, 3,933,482.

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Sandford, Phillip A.; and York, John D., to Ford Motor Company. Quick-connect tubing coupling. 3,933,378, Cl. 285-319.000.

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Sandoz, Inc.: *See*—
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Sandoz Ltd., (Sandoz AG): *See*—
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Sanford Research Company: *See*—
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Sanford, Robert L.; and Wesolek, Casimer J., to General Motors Corporation. Resilient filler and bumper support arrangement. 3,933,385, Cl. 293-63.000.

Sanjana, James, to Lawrence Peska Associates, Inc., a part interest. Border flashers. 3,934,249, Cl. 340-340.000.

Sanko Engineering & Construction Co., Ltd.: *See*—
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Sankyo Company Limited: *See*—
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Sansui Electric Co., Ltd.: *See*—
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Santoro, Ralph: *See*—
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Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
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Sarantakis, Dimitrios, to American Home Products Corporation. Des-(ser^{13})-srif and intermediates. 3,933,784, Cl. 260-112.50R.

Sarmiento, Rafael: *See*—
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Sasajima, Kikuo: *See*—
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Sato, Akira: *See*—
Shiba, Keisuke; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,933,510.

Sato, Yohta; Matsuda, Masakata; Ohi, Yukio; and Matsumori, Toyomi, to Nippon Yakin Kogyo Company Limited. Method of producing ferro-nickel or metallic nickel. 3,933,477, Cl. 75-82.000.

Satomura, Masato, to Fuji Photo Film Co., Ltd. Cinnamylideneacetic acid esters. 3,933,885, Cl. 260-465.00D.

Satovsky, Boris Ivanovich: *See*—
Zalesov, Oleg Alexandrovich; Lomakin, Mikhail Sergeevich; Merkulov, Vadim Nikolaevich; Pevzner, Leonid Davidovich; Peters, Gugo Borisovich; Potapov, Vladimir Dmitrievich; Rzhevsky, Vladimir Vasilievich; Tolpezhnikov, Lev Ivanovich; Yarizov, Anatoly Danilovich; Mamkin, Viktor Modestovich; Raskin, Veniamin Lvovich; Satovsky, Boris Ivanovich; and Yartsev, Grigory Matveevich, 3,934,126.

Satzinger, Roland. Method and apparatus for the unwinding of bands. 3,933,322, Cl. 242-55.000.

Sauer, Gerd: *See*—
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Saufferer, Helmut, to Daimler-Benz Aktiengesellschaft. Linear reluctance motor for the propulsion of rail transportation means. 3,934,183, Cl. 318-135.000.

Saunders, John Christopher: *See*—
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,933,829.

Savies, Bessie Snowden, executrix: *See*—
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Sawa, Natsuo; and Hoda, Masahiro. Method of rust-preventing for copper and copper alloy. 3,933,531, Cl. 148-6.14R.

Sawabu, Hitoshi: *See*—
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Saygin, Ferdi, to Henkel & Cie GmbH. Diamino-nitro-benzene compounds. 3,933,886, Cl. 260-465.00D.

Scarpitta, Giuseppe: *See*—
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Schade, Hans Robert, to General Foods Corporation. Taste modifier for artificial sweeteners. 3,934,047, Cl. 426-548.000.

Schaffner, Ernst; Eilingsfeld, Heinz; and Patsch, Manfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of dimethylbenzophenone. 3,933,917, Cl. 260-591.000.

Schamel, Alfred H., to Tektronix, Inc. Power supply regulator high-line shunt bypass. 3,934,189, Cl. 321-11.000.

Schaub, Fritz: *See*—
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Schauffler, Peter P. Observation/interpretation system. 3,933,326, Cl. 244-33.000.

Scheer, Marcel: *See*—
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Scheffler, Norman E., to Dow Chemical Company, The. Protective housing for a liquid sample container. 3,933,186, Cl. 141-97.000.

Scheinpflug, Hans: *See*—
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Scheiter, Heinz: *See*—
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Schellekens, Jozef Remy: *See*—
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Schelling, Hans-Peter; and Schaub, Fritz, to Sandoz Ltd., (Sandoz AG). Insecticidal 1,3-benzodioxol derivatives. 3,933,804, Cl. 260-240.00H.

Scherf, Gerald F.: *See*—
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Schering Aktiengesellschaft: *See*—
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Scheuerle, Willy, to Willy Scheuerle Fahrzeugfabrik. Digital system for controlling the wheels of a heavy-duty commercial vehicle. 3,933,215, Cl. 180-23.000.

Schick, Lothar: *See*—
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Schickedanz, Wayne M.: *See*—
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Schievelbein, Vernon Hugo, to Texaco Inc. Method of separating hydrogen sulfide from carbon dioxide. 3,934,012, Cl. 423-232.000.

Schiff, Maurice Leon, to United States of America, Navy. Spread spectrum modem. 3,934,203, Cl. 325-65.000.

Schiro, Donald J.: *See*—
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Schladitz, Hermann J. Electric fluid heating device. 3,934,117, Cl. 219-382.000.

Schlaefer, Francis W., to Rohm and Haas Company. Production of unsaturated acids, esters and nitriles, and catalyst therefor. 3,933,888, Cl. 260-465.900.

Schlatter, Gerald Lance; and Miller, Charles Eveleigh, to International Telephone and Telegraph Corporation. Gravitometers. 3,934,127, Cl. 235-151.340.

Schlauch, Walter F.: *See—*
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Schlegel Manufacturing Company, The: *See—*
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Schmedemann, Walter. X-ray examination apparatus comprising a counter-weight for the image section. 3,933,251, Cl. 250-439.000.

Schmeiser, Kurt: *See—*
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Schmeling, Edith-Luise; Friebe, Herbert; and Reininghaus, Ulrich, to Electro Chemical Engineering GmbH. Electroless metal plating. 3,934,054, Cl. 427-8.000.

Schmermund, Alfred. Apparatus for manufacturing a wrapper web provided with a tear-open strip. 3,933,568, Cl. 156-512.000.

Schmid, Hermann Pius, to AB Bofors. Method of producing polyurethane-based cores and moulds according to the so-called cold-box procedure. 3,933,727, Cl. 260-37.00N.

Schmid, Peter, to Mettler Instrumente AG. Buoyancy balance. 3,933,211, Cl. 177-207.000.

Schmid, Wolfgang: *See—*
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Schmidt, Delf: *See—*
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Schmidt, Klaus: *See—*
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Schmidt, Martin: *See—*
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Schmiegel, Walter Werner, to Du Pont de Nemours, E. I., and Company. Fluoroelastomer composition and curing process. 3,933,732, Cl. 260-42.270.

Schneckenburger, Donald R.: *See—*
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Schneider, John R. Plate and frame type filtering apparatus. 3,933,792, Cl. 210-231.000.

Schneider, William P.: *See—*
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Scholes, Addison B., to Ball Corporation. Apparatus and method for treating vitreous surfaces. 3,933,457, Cl. 65-60.000.

Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Pesticidal 4,5-bis-(trifluoromethylimino)-diazoles. 3,934,019, Cl. 424-273.000.

Scholpp, Martin: *See—*
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Scholz, Berthold: *See—*
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Schonberg, Herman. Carrier for transferring images. 3,933,503, Cl. 96-85.000.

Schoon, David J., to Minnesota Mining and Manufacturing Company. Threshold signal circuitry for scanning apparatus. 3,934,136, Cl. 250-214.00R.

Schoonover, Stanley C.; and Harrel, Jack D., to Landis Tool Company. Machine tool control system. 3,934,185, Cl. 318-565.000.

Schoonover, Stanley C.; and McIntosh, Michael D., to Landis Tool Company. Tachometer circuit. 3,934,200, Cl. 324-163.000.

Schoppee, Lawrence W., to Package Machinery Company. Gum slab feed apparatus. 3,933,064, Cl. 83-11.000.

Schramm, Arthur G. Ore processing furnace. 3,933,342, Cl. 266-15.000.

Schramm, Jurgen: *See—*
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Schrock, Wilfried: *See—*
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Schuep, Willy: *See—*
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Schuler, Wilhelm-Alfons: *See—*
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Schuller, James J.; and Marsh, Ronald W., to Pullman Incorporated. Anti-pilferage locking device. 3,933,384, Cl. 292-285.000.

Schultz, Peter C.: *See—*
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Schulz, Arthur C.; and Rosen, Herbert J., to Hooker Chemicals & Plastics Corporation. Simultaneous production of chlorine dioxide and a salt of a strong acid. 3,933,987, Cl. 423-478.000.

Schulze, Paul-Eberhard, to Schering Aktiengesellschaft. Preparation of organic radiohalogen compounds. 3,933,869, Cl. 260-397.400.

Schumacher, Ernst E. Method and apparatus for improving photomechanical reproduction by contrast decrease. 3,934,081, Cl. 178-6.800.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Support and storage tray. 3,933,243, Cl. 206-349.000.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Plastic container and latch. 3,933,381, Cl. 292-57.000.

Schwartz, Robert E.: *See—*
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Schwarz, Hans-Helmut: *See—*
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Schwarz, Meyer; Sonnet, Philip E.; and Wakabayashi, Nobel, to United States of America, Agriculture. Arthropod maturation inhibitors. 3,933,865, Cl. 260-348.00A.

Schweizer, Gottfried; and Svoboda, Josef, to Gertsch AG. Safety ski binding. 3,933,363, Cl. 280-11.35T.

Schwerdtel, Wulf: *See—*
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SCM Corporation: *See—*
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Pratt, Ivor; and Boschert, Ulrich, 3,933,757.

Scordato, Emil A., to Medical Laboratory Automation, Inc. Pipettes. 3,933,048, Cl. 73-425.600.

Scott, Ellery A.: *See—*
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Scott & Fetzer Company, The: *See—*
Broad, Roy M., 3,932,933.

Scott, Louie B.; and Scott, Ellery A. Trench digging machinery. 3,932,951, Cl. 37-86.000.

Scrine, Gerald Robin: *See—*
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Seals, Harold, to Kline, Larry Harold. Spill colliection device. 3,933,185, Cl. 141-88.000.

Searle, Brian Christopher; and Ritter, Glenn Richard, to Tiltman Langley Ltd. Coin validator. 3,933,232, Cl. 194-100.00A.

Seebacher, Baerbel, to Siemens Aktiengesellschaft. Method of stabilizing the hot resistance of ceramic positive temperature coefficient resistors. 3,934,058, Cl. 427-89.000.

Seeburg Corporation: *See—*
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Seeholzer, Josef: *See—*
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Seha, Zdenek, to Ciba-Geigy AG. Process for the manufacture of amino-anthraquinones. 3,933,866, Cl. 260-382.000.

Seiber, Rita P.: *See—*
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Seiberling, Mildred Kelley: *See—*
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Seiberling, Theophilus K., 3,933,566.

Seiberling, Theophilus K., to Seiberling, Mildred Kelley, a part interest. Tires, etc. 3,933,553, Cl. 156-123.000.

Seiberling, Theophilus K., to Seiberling, Mildred Kelley, a part interest. Tires, etc. 3,933,566, Cl. 156-272.000.

Seidehamel, Richard J.; and Dungan, Kendrick W., to Mead Johnson & Company. 4-[2-(Isopropylamino)ethyl]pyrocatechol intraocular pressure lowering process. 3,933,998, Cl. 424-28.000.

Seifer, Hermann: *See—*
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Seiler, Erhard: *See—*
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Seiler, Ronald: *See—*
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Seiscom Delta Inc.: *See—*
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Seki, Toru. Method of treatment of sludges with size-adjusted carbon. 3,933,634, Cl. 210-46.000.

Sekmakas, Kazys; and Petrovich, Paul, to DeSoto, Inc. Low temperature curing corrosion resistant polyurethane coatings. 3,933,760, Cl. 260-77.5CR.

Sellstedt, John H., to American Home Products Corporation. Intermediates for producing semi-synthetic cephalosporins. 3,933,810, Cl. 260-243.00C.

Semenov, Nikolai Nikolaevich: *See—*
Bokov, Jury Sergeevich; Gurzheev, Valery Nikolaevich; Zakharov, Vladimir Ivanovich; Korsakov, Vladimir Sergeevich; Lavrischev, Vadim Petrovich; Goron, Alla Grigorievna; Glikman, Mark Leonovich; Semenov, Nikolai Nikolaevich; and Matvienko, Viktor Yakovlevich, 3,933,609.

Semperit Aktiengesellschaft: *See—*
Printz, Gerhard; and Haase, Ralf, 3,933,565.

Seni, Leonard S.; Witte, Arnold C.; and Coleman, Richard L., to Texaco Inc. Lubricant with synergistic extreme pressure additives. 3,933,657, Cl. 252-29.000.

Senoo, Saburo: *See—*
Watanabe, Teiko; Hayashi, Shigeyoshi; Ouchi, Shunji; and Senoo, Saburo, 3,933,902.

Sensormatic Electronics Corporation: *See—*
Humble, David R., 3,933,240.

Sequin, Carlo Heinrich, to Bell Telephone Laboratories, Incorporated. Two-dimensional transfer in charge transfer devices. 3,934,261, Cl. 357-24.000.

Seto, Kunihira: *See—*
Arai, Atsuaki; Hibino, Noburo; and Seto, Kunihira, 3,933,502.

Setty, H. S. Nagaraja: *See—*
Wakefield, Gene Felix; and Setty, H. S. Nagaraja, 3,933,981.

Shamlian, Ralph B.; and Hollingsworth, Ashley J., to Farallon Industries, Inc. Decompression indicating instrument for divers. 3,933,049, Cl. 73-432.00R.

Shank, Harvey T.: *See—*
Lamb, Norman C.; and Shank, Harvey T., 3,933,272.

Sharma, Vijay Ratna: *See—*
Ashton, Stanley; Sharma, Vijay Ratna; and Taylor, John Anthony, 3,933,907.

Sharp, Richard William. Extensible shafts and fishing spears. 3,932,953, Cl. 43-6.000.

Sharps Associates: *See—*
Razdan, Raj Kumar; and Pars, Harry George, 3,934,024.

Shaw, Bryan: *See—*
Ray, Neil Hunter; Shaw, Bryan; and Lane, Bruce Cochran, 3,933,689.

Shawver, Bruce M.: *See—*
McKeehan, Ernest R.; Shawver, Bruce M.; Schiro, Donald J.; and Taft, William E., 3,933,581.

Shea, Philip J.: *See—*
Abdallah, Abdulmuniem H.; and Shea, Philip J., 3,934,020.

Shee, William S., to Signal Office Products Co. Key holder and rack therefor. 3,933,017, Cl. 70-456.00R.

Shekleton, Jack R., to International Harvester Company. Rotating cup fuel injector. 3,933,133, Cl. 123-30.00C.

Sheldon, Paul B.: *See—*
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Shell Oil Company: *See—*
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Knapp, Randolph H., 3,933,204.
Powell, James E., 3,933,809.
Winquist, Bruce H. C., 3,933,974.

Shepard, Richard W.; and Ashmead, Albert S., to Torrington Company, The. Latch pivot for latch needle. 3,934,109, Cl. 219-121.0LM.

Sherman, Jack A.: *See—*
Jorgenson, Morris E.; Sheldon, Paul B.; Sherman, Jack A.; and Wardell, Peter S., 3,934,118.

Sherritt Gordon Mines Limited: *See—*
Evans, David John Ivor; and Masters, Ian M., 3,933,973.

Sherwood Medical Industries Inc.: *See—*
Weichselbaum, Theodore E.; and Gusky, William W., 3,933,652.

Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 3,933,500, Cl. 96-74.000.

Shiba, Keisuke; Hinato, Masanao; and Ohi, Reiichi, to Fuji Photo Film Co., Ltd. Fogged, direct positive silver halide emulsion containing a nitro-substituted fluorene desensitizer. 3,933,505, Cl. 96-101.000.

Shiba, Keisuke; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 3,933,510, Cl. 96-124.000.

Shiba, Shunji: *See—*
Oguma, Takeshi; Shiba, Shunji; Moritani, Nobuo; and Takeuchi, Yoichi, 3,933,590.

Shibata, Akira, to Chugai Denki Kogyo Kabushiki-Kaisha. Electrical contact material. 3,933,485, Cl. 75-173.00A.

Shibata, Akira, to Chugai Denki Kogyo Kabushiki-Kaisha. Silver-metal oxide composite and method of manufacturing the same. 3,933,486, Cl. 75-173.00A.

Shibata, Kunio: *See—*
Kosaka, Kenzo; Morioka, Shin; Shibata, Kunio; Goto, Takashi; and Takahashi, Eizi, 3,932,986.

Shibata, Yoshiki; Kakigami, Hideo; and Takeda, Syuzo, to Toray Industries, Inc. Method and apparatus for determining the total oxygen demand of combustible materials in aqueous dispersion. 3,933,429, Cl. 23-230.0PC.

Shields, John J.: *See—*
Tu, Robert S.; and Shields, John J., 3,933,407.

Shim, Kyung Sup, to Stauffer Chemical Company. Polyalkylene glycol poly-phosphorus compounds in polyurethane foams. 3,933,696, Cl. 260-2.5AR.

Shimada, Katsuji; and Shimada, Katsuyuki. Backward openable container with a device to prevent its inner tray from being slipped downward. 3,933,299, Cl. 229-20.000.

Shimada, Katsuyuki: *See—*
Shimada, Katsuji; and Shimada, Katsuyuki, 3,933,299.

Shimada, Sumio: *See—*
Fujii, Osamu; Kishimoto, Toshio; Kosuge, Hisao; Nagamine, Ryoji; and Shimada, Sumio, 3,933,697.

Shimizu, Makoto: *See—*
Kasugai, Tsuneo; Shimizu, Makoto; and Ohara, Shinichiro, 3,933,578.

Shimoda, Kazuho, to Konishiroku Photo Industry Co., Ltd. Toner cleaning apparatus in electrophotographic copying machine. 3,932,910, Cl. 15-301.000.

Shinano, Takayuki: *See—*
Machi, Sueo; Matui, Yasushi; Shinano, Takayuki; Aono, Taiji; Hibi, Yoshiharu; Oshima, Shozo; and Kashiki, Masayuki, 3,933,731.

Shinohara, Isao; and Aoyagi, Juro, to B. R. Chemical Co., Ltd. Water soluble linear macroamine polymers and method of producing them. 3,933,717, Cl. 260-29.60R.

Shinozaki, Masanobu, to Victor Company of Japan, Limited. Switching circuit. 3,934,158, Cl. 307-239.000.

Shinozaki, Takashi; and Kokufukata, Seigo, to Victor Company of Japan, Limited. Dark current correction circuit in two-tube color television camera. 3,934,266, Cl. 358-44.000.

Shiokawa, Kozo: *See—*
Kishino, Shigeo; Kudamatsu, Akio; and Shiokawa, Kozo, 3,933,947.

Shionogi & Co., Ltd.: *See—*
Kano, Hideo; Ogata, Masaru; and Yukinaga, Hisajiro, 3,933,828.

Shipowners Refrigerated Cargo Research Association: *See—*
Carter, William Derrick Marshall; and Scrine, Gerald Robin, 3,933,004.

Shirakawa, Hideki: *See—*
Ikeda, Sakuji; Ozaki, Atsumu; Okawara, Makoto; Mizoroki, Tsutomu; Uchino, Masahiro; Shirakawa, Hideki; and Kawata, Noboru, 3,933,770.

Shires, Val Henry, to Surf Air Conditioning, Inc. Portable electric capacitor tester using an LED indicator. 3,934,195, Cl. 324-72.500.

Shmarovoz, Nikolai Pavlovich: *See—*
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnəkov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich, 3,933,574.

Shmuk, Jury Alexandrovich: *See—*
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnakov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich, 3,933,574.

Shook, William B., to Thurston, Inc. Saddle seat mount with special support post and cooperating clamp assembly. 3,933,391, Cl. 297-195.000.

Shorten, Derek William: *See—*
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Shorter, Donald E.: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Showa Highpolymer Co., Ltd.: *See—*
Hanyuda, Toshiaki; and Takiyama, Eiichiro, 3,933,857.

Shuler, Bernard R., to American Air Filter Company, Inc. Air quality sensing apparatus. 3,933,043, Cl. 73-336.000.

Shumaker, Lyle L., to PPG Industries, Inc. Preparing transparent assemblies for lamination. 3,933,552, Cl. 156-104.000.

Sickles, Ralph A. Drive mechanism for a spiral array of individual film photographs. 3,933,413, Cl. 353-110.000.

Siddiqui, Iftikhar H.: *See—*
Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar H., 3,933,744.

Siddiqui, Iftikhar Hussain: *See—*
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Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, 3,933,750.

Sieb, Reinhard, to H. Jungheinrich & Co. Vehicle control apparatus for a closed transporting system. 3,933,099, Cl. 104-88.000.

Sieber, Peter: *See—*
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik Marie, 3,934,008.

Siegler, Manfred; and Froede, Otto, to BASF Aktiengesellschaft. Manufacture of wood materials containing wood protectant. 3,933,704, Cl. 260-17.200.

Siemens Aktiengesellschaft: *See—*
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Bonig, Heinrich; and Waldmann, Hermann, 3,934,184.
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Siemens & Halske Aktiengesellschaft: *See—*
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Simanova, Nadezhda Pavlovna: *See—*
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Kormer, Vitaly Abramovich; Lapuk, Irina Moiseevna; Lobach, Mark Iosifovich; Simanova, Nadezhda Pavlovna; Soloviev, Kim Sergeevich; Chepurnaya, Tamara yakovlevna; and Jufa, Tatyana Lvovna, 3,933,777.

Simkins, Robert John James: *See—*
Salter, David Anthony; and Simkins, Robert John James, 3,933,926.

Simms, James B., to Simms, James B. Multi-angle grinding fixture. 3,932,964, Cl. 51-220.000.

Sincock, Thomas F.: *See—*
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Singer Company, The: *See—*
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Murray, Ian S., 3,933,106.

Singh, Balwant, to American Cyanamid Company. Photosensitive azido processes. 3,933,497, Cl. 96-49.000.

Sinn, Helmut, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet pile delivery for printing presses. 3,933,352, Cl. 271-189.000.

Sintokogio, Ltd.: *See—*
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SKF Industrial Trading and Development Company, B.V.: *See—*
Hallerback, Stig Lennart; and Lachonius, Leif, 3,932,929.

Skidmore, Sam C. Drill head assembly. 3,933,210, Cl. 173-132.000.

Skinner, James R.; and Lang, Albert, Jr., to Varian Associates. Sputter coating apparatus having improved target electrode structure. 3,933,644, Cl. 204-298.000.

Skochdopole, Richard E.; and Denslow, Keith R., to Dow Chemical Company, The. Preparation of dunnage material. 3,933,959, Cl. 264-45.500.

Skoog, Ivan H.: *See—*
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Sleptsov, Vasily Mikhailovich: *See—*
Dudko, Daniil Andreevich; Samsonov, Grigory Valentinovich; Maximovich, Boleslav Ivanovich; Zelenin, Vitaly Ivanovich; Klimanov, Alexandr Sergeevich; Potseluiko, Vladimir Nikolaevich; Trunov, Gennady Vasilievich; and Sleptsov, Vasily Mikhailovich, 3,933,482.

Sliwka, Wolfgang: *See—*
Atzrott, Otto; Sliwka, Wolfgang; and Hartmann, Heinz, 3,934,069.

Sloan, Benjamin Johnston, Jr., to Texas Instruments Incorporated. Process for fabricating integrated circuits utilizing ion implantation. 3,933,528, Cl. 148-1.500.

Sloop, David J.: *See—*
Vasudevan, Karappurath; and Sloop, David J., 3,934,176.

Smalheiser, Lawrence A., to Stauffer Chemical Company. Process for removing ethylenically unsaturated chlorinated hydrocarbons from gas streams. 3,933,980, Cl. 423-245.000.

Small, Leonard J.: *See—*
O'Connor, Joseph R.; and Small, Leonard J., 3,933,572.

Smerak, Louis J.; and Miller, Jason A., to Caravan Products Co., Inc. Bakery product and process. 3,934,040, Cl. 426-20.000.

Smith, Colin Howard Stanwell, to Automatic Revenue Controls (Europa) Ltd. Coin feeding devices. 3,933,162, Cl. 133-1.00R.

Smith, Donald J., to Smith-Schrerer & Assoc., Inc. Moisture proof cable splice enclosure. 3,934,076, Cl. 174-87.000.

Smith, Graham Westley: *See—*
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Smith, Harry A.; and Kobel, Erwin H., to Dow Chemical Company, The. Rapid setting adhesive compounds. 3,933,936, Cl. 260-841.000.

Smith, Jack L.; Gray, Darby A.; and Sullivan, Brian R., to Honeywell Information Systems, Inc. Document handling assembly for a printer. 3,933,234, Cl. 197-127.00R.

Smith, Kenneth Cecil, to BOC International Limited. Filtration. 3,933,629, Cl. 210-17.000.

Smith, Nathan R., to Micro Component Technology, Inc. High speed magnetic core handler. 3,933,247, Cl. 209-73.000.

Smith, Russel I. Rotary engine. 3,933,131, Cl. 123-8.470.

Smith-Schrerer & Assoc., Inc.: *See—*
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SmithKline Corporation: *See—*
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Colella, Donald F.; and Kaiser, Carl, 3,933,913.
Lewis, Joseph J.; and Trei, John E., 3,934,037.

Smoot, Edward H., to Schlegel Manufacturing Company, The. Bearing and seal for tumbler belt clothes dryer. 3,932,947, Cl. 34-242.000.

Snarr, James L.: *See—*
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Snodgrass, Thomas J.: *See—*
Cruckshank, Ira G.; and Snodgrass, Thomas J., 3,933,562.

Snopko, Paul A., to Zenith Radio Corporation. Video disc and method of playback. 3,934,262, Cl. 358-4.000.

Snyder, Frank M., to Liquid Feed Commodities Inc. Liquid ruminant feed supplement. 3,934,041, Cl. 426-69.000.

Societa' Italiana Resine S.p.A.: *See—*
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Cardini, Giuliano; and Zotti, Aldo, 3,934,039.
Ferlazzo, Natale; Buzzi, Gian Fausto; and Ghirga, Marcello, 3,933,686.

Societe Anonyme dite: Societe Nationale Des Petroles D'Aquitaine: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe Nationale des Petroles d'Aquitaine: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Sokolov, Lev Borisovich; and Kudim, Tatyana Vladimirovna. Method for preparing aromatic polyesters. 3,933,713, Cl. 260-29.20E.

Solman, Arthur James: *See—*
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Soloviev, Kim Sergeevich: *See—*
Babitsky, Boris Davidovich; Denisova, Tamara Trofimovna; Kormer, Vitaly Abramovich; Lapuk, Irina Moiseevna; Lobach, Mark Iosifovich; Simanova, Nadezhda Pavlovna; Soloviev, Kim Sergeevich; Chepurnaya, Tamara yakovlevna; and Jufa, Tatyana Lvovna, 3,933,777.

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Sonnet, Philip E.: *See—*
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Sony Corporation: *See—*
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Sorbier, Pierre. Method of moulding articles from a paste like material. 3,933,968, Cl. 264-297.000.

Sorenson, Virgil H. Ladder adjusting and stabilizing apparatus. 3,933,221, Cl. 182-172.000.

Soshizaki, Junichi: *See—*
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Soussan, Salomon: *See—*
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South, Lewis E., to Weather Box Company, The. Supermarket produce display fixture. 3,933,006, Cl. 62-231.000.

Spahrbier, Horst: *See—*
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Sperry Rand Corporation: *See—*
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Spevack, Jerome S., to Deuterium Corporation. Dual temperature system. 3,933,995, Cl. 423-580.000.

Spier, Raymond E.: *See—*
McAleer, William J.; Spier, Raymond E.; and Posch, Kenneth L., 3,933,585.

Spizzichino, Giancarlo: *See—*
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Spooner, Robert E., to Spooner, Robert E.; and Spooner, Sylvia M. Safety guard for press. 3,933,089, Cl. 100-53.000.

Spooner, Robert J.; and Dillon, Oscar W., to Cashin Systems Corporation. Dual speed stacker paddle assembly. 3,933,066, Cl. 83-92.000.

Spooner, Sylvia M.: *See—*
Spooner, Robert E., 3,933,089.

Spratt, Brendan J., to Bendix Corporation, The. Automatic t_o control for use in airborne DME system. 3,934,251, Cl. 343-6.50R.

Spry, Douglas O., to Eli Lilly and Company. Cephalosporin michael adducts. 3,933,806, Cl. 260-243.00C.

Spurr, Arthur R., to University of California, The Regents of the. Low viscosity embedding medium. 3,933,718, Cl. 260-30.4EP.

Squire, Christopher John: *See—*
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Staebler, David Lloyd: *See—*
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Stafsudd, Oscar M.: *See—*
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Standard Oil Company: *See—*
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Russum, Leonard W.; and Hoekstra, Gerald B., 3,933,620.

Standing, Charles N., to Pillsbury Company, The. Apparatus for separating dried fruit aggregates. 3,933,086, Cl. 99-646.00R.

Staniforth, Susan Elizabeth: *See—*
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Starominsky, Naum Mikhailovich: *See—*
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnakov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich, 3,933,574.

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Shim, Kyung Sup, 3,933,696.
Smalheiser, Lawrence A., 3,933,980.

Steel, John F. Prefabricated modular structural panels. 3,932,976, Cl. 52-309.000.

Steele, Fred W., to Ball Corporation. Photopolymerizable polymers having anhydride-containing groups. 3,933,746, Cl. 260-47.00C.

Steig, Hans, to Accumulatorenfabriken Wilhelm Hagen AG. Accumulator cell. 3,933,522, Cl. 136-6.00R.

Steiger Tractor Inc.: *See—*
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Stein, Dieter: *See—*
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Stein, Werner: *See—*
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Steinwandter, Friedrich: *See—*
List, Hans; Cichocki, Rainer; Kirchweger, Karl; and Steinwandter, Friedrich, 3,933,142.

Stellwagen, Jean Henri, to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal. Spark distributor. 3,933,138, Cl. 123-146.50R.

Sten, Leif Ragnvald; and Ohlsson, Nils Runol Gustav, to Kockums Mekaniska Verkstads AB. Apparatus for the correction of shear forces. 3,934,133, Cl. 235-193.000.

Stephens, John A., to Monsanto Company. N-arylsulfonyl carbamates. 3,933,894, Cl. 260-470.000.

Stephenson, Robert Edgar. Ear tag inserting pliers. 3,933,291, Cl. 227-67.000.

Sterling Drug Inc.: *See—*
Collins, Joseph C.; and Diana, Guy D., 3,933,837.

Stern, Leif E., to Nederman, Bill Peter Philip. Abrasive disc. 3,932,966, Cl. 51-356.000.

Sternberg, James C., to Beckman Instruments, Inc. Rate sensing batch analysis method. 3,933,593, Cl. 195-103.50R.

Stevens, Frederick F., Jr., to Hoff-Stevens, Inc. Universal tavern unit for keg tapping device. 3,933,282, Cl. 222-400.700.

Stewart, James A., to GTE Automatic Electric Laboratories Incorporated. Automatic disconnect circuit for subscriber carrier telephone system. 3,934,089, Cl. 179-2.50R.

Stidham, James Richard, to Bell Telephone Laboratories, Incorporated. Automatic gain compensation in time division switching system. 3,934,091, Cl. 179-15.0AT.

Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., to Stock Equipment Company. Apparatus for inserting closure means into a container. 3,932,979, Cl. 53-76.000.

Stock Equipment Company: *See—*
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Stockamollan AB: *See—*
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Stowe, Ralph A.; and Howe, Joseph W. Chopper assembly for x-ray machine. 3,934,151, Cl. 250-505.000.

Strack, Richard R., to American Optical Corporation. Fiber optic image shape converter and method of making the same. 3,933,556, Cl. 156-155.000.

Strickman, Donna F.; and Strickman, Melvyn B. Hair curler affixable with one hand. 3,933,161, Cl. 132-40.000.

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Stuckert, Paul E., to International Business Machines Corporation. Broad band directional coupling circuit. 3,934,213, Cl. 333-10.000.

Studen, Charles E., to Donray Products Company. Sealing apparatus utilizing adjustable jaw portions. 3,933,571, Cl. 156-583.000.

Stukel, James; and Rentz, Robert G., to Ottawa Silica Company. Classifier for particulate material. 3,933,626, Cl. 209-134.000.

Sucov, Eugene W.; and Weaver, Lelland A. C., to Westinghouse Electric Corporation. Metal halide vapor laser. 3,934,211, Cl. 331-94.50G.

Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, to Sumitomo Chemical Company, Limited. Process for the production of hydroperoxides. 3,933,921, Cl. 260-610.00B.

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Swett, Leo Ralph, to Abbott Laboratories. 4,6-Dihydro-1,3-dimethyl-8-phenylpyrazolo[4,3-e] [1,4]diazepin-5-(1H)-one and derivatives as anti-inflammatory agents. 3,934,018, Cl. 424-273.000.
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Takahata, Yasushi; Karimori, Akira; Kato, Toshiya; and Nomura, Katsuo, to Kohjin Co., Ltd.; and Aika Kogyo Co., Ltd. Method of processing laminated decorative sheet for imparting permanent shape thereto. 3,933,558, Cl. 156-209.000.
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Kasami, Akinobu; and Naito, Makoto, 3,934,260.
Tolf, Carl O., Jr., to Cato, Inc. Pipe sleeve. 3,933,336, Cl. 249-177.000.
Tolleson, Leon H.: *See—*
Wright, Lawrence W.; Tolleson, Leon H.; Abrahamson, Daniel P.; Thomas, Paul M.; and Crile, Eugene E., 3,933,570.
Tolnar, Emil J., Jr.: *See—*
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Zalesov, Oleg Alexandrovich; Lomakin, Mikhail Sergeevich; Merkulov, Vadim Nikolaevich; Pevzner, Leonid Davidovich; Peters, Gugo Borisovich; Potapov, Vladimir Dmitrievich; Rzhevsky, Vladimir Vasilievich; Tolpezhnikov, Lev Ivanovich; Yarizov, Anatoly Danilovich; Mamkin, Viktor Modestovich; Raskin, Veniamin Lvovich; Satovsky, Boris Ivanovich; and Yartsev, Grigory Matveevich, 3,934,126.
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Toray Industries, Inc.: *See—*
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Naito, Nagayoshi; Hashimoto, Sadakatu; Komuro, Yoshiyuki; Suyama, Tutomu; and Yonekura, Yukio, 3,933,762.
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Torghele, Flavio, to Treg S.p.A. Process for manufacturing flexible hoses of elastomeric material having a cavity wall. 3,933,554, Cl. 156-143.000.
Torgow, Abraham M. Top and apparatus for playing therewith. 3,933,356, Cl. 273-108.000.
Torossian, Dieran Robert: *See—*
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Total Disposal Systems, Inc.: *See—*
Kerr, Donald M., 3,934,038.
Toukan, Sameeh Said; and Hauptschein, Murray, to Pennwalt Corporation. Fluorinated aromatic and heterocyclic sulfides. 3,933,819, Cl. 260-251.000.
Toyo Rubber Chemical Industrial Corporation: *See—*
Fujii, Osamu; Kishimoto, Toshio; Kosuge, Hisao; Nagamine, Ryoji; and Shimada, Sumio, 3,933,697.
Toyo Sodo Manufacturing Co., Ltd.: *See—*
Fukushi, Naobumi; Nakazawa, Hideaki; Soshizaki, Junichi; and Iikuni, Tetsuo, 3,933,710.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Traelnes, Knut Rude: *See—*
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Tramier, Bernard, to Societe Nationale des Petroles d'Aquitaine. Production of organic sulphoxides. 3,933,855, Cl. 260-329.00R.
Transelektro Magyar Villamossagi: *See—*
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Traskos, Richard T., to Lith-Kem Corporation. Printing plate comprising diazo-borofluoride and diazo resin layers. 3,933,499, Cl. 96-68.000.

TRE Corporation: *See—*
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Orr, Lavern G.; and Stone, Etric Lee, 3,933,020.
Treadwell, Kenneth: *See—*
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Trei, John E.: *See—*
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Trenkler, George, to Texas Instruments Incorporated. Electrical resistance heaters. 3,934,119, Cl. 219-543.000.
Trepanier, Donald L.; and Britton, Thomas C., to Dow Chemical Company, The. Phenyl -thiourea, -carbothioamide and -carbonothioamide derivatives. 3,933,833, Cl. 260-293.730.
Trienco, Inc.: *See—*
Bunn, Julian W., Jr., 3,933,614.
Tropicana Products, Inc.: *See—*
Rossi, Anthony T., 3,933,264.
Trotel, Jacques, to Thomson-CSF. Device for the accurate positioning of an object holder in relation to the elements of a particle-type optical system, and a particle-type optical system equipped with said device. 3,934,187, Cl. 318-640.000.
Trowbridge, Darrell L., to Brunswick Corporation. Variable response snowmobile suspension system. 3,933,213, Cl. 180-5.00R.
Trujillo, Patricio E.; Campbell, Evan E.; and Eutsler, Bernard C., to United States of America, Energy Research and Development Administration. Method and apparatus for sampling atmospheric mercury. 3,933,431, Cl. 23-232.00R.
Trumbetas, Jerome F.: *See—*
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Trunov, Gennady Vasilievich: *See—*
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Ketchum, Lewis A., 3,933,012.
Tschoegl, Nicholas W., to California Institute of Technology. Dynamic rheometer. 3,933,032, Cl. 73-67.100.
Tsuchiya, Hiroshi, to Canon Kabushiki Kaisha. Improvements in transfer electrophotography. 3,933,490, Cl. 96-1.400.
Tsuchiya, Kaichi: *See—*
Nagashima, Shinichiro; and Tsuchiya, Kaichi, 3,933,664.
Tsurumi, Kotaro; Nishiyama, Shigeyuki; and Nishimura, Kunio, to Nihon Spindle Seizo Kabushiki Kaisha. Apparatus and process for automatically supplying cops to a thread winder. 3,933,320, Cl. 242-35.50R.
Tsuzuki, Isao; Takahashi, Yasuie; and Koga, Hideaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automotive vehicle shift control mechanism for manual transmissions. 3,933,057, Cl. 74-476.000.
Tsuzuki, Yukikazu: *See—*
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Tu, Robert S.; and Shields, John J. Articles coated with synergistic antifog coatings based on hydrophillic polymers and organosiloxaneoxyalkylene block copolymers. 3,933,407, Cl. 350-61.000.
Tuma, Rudolf; and Neuwald, Fritz, to Chemische Werke Witten GmbH. Cosmetic composition containing an ethoxylated glyceride mixture. 3,934,003, Cl. 424-59.000.
Tung, Chi Fang, to Minnesota Mining and Manufacturing Company. Retroreflective sheet material. 3,934,065, Cl. 428-241.000.
Tur, Wladimir: *See—*
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Tyler, William E., III; and Dines, Martin B., to Exxon Research and Engineering Company. Ligand complexes of cu(1)salts. 3,933,878, Cl. 260-438.100.
UBE Industries, Ltd.: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; and Nagamori, Tomitada, 3,933,736.
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Uchino, Masahiro: *See—*
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Uemura, Saburo, to Sony Corporation. System for magnetically recording and reproducing still video pictures and audio information. 3,934,268, Cl. 360-101.000.
Uhlarik, William J., to International Telephone and Telegraph Corporation. Submarine pipeline leak locator or the like. 3,933,031, Cl. 73-40.50R.
Ujiie, Hideo: *See—*
Uno, Motohiko; Noma, Shigeaki; Ujiie, Hideo; Masui, Kazuo; and Kanesa, Tadashi, 3,933,137.
Ulbrich, Josef. Profile wire ring. 3,933,010, Cl. 63-15.600.
Underland, Gary E.; and Novak, Thomas, to Borroughs Tool & Equipment Corporation. Riveting device. 3,933,019, Cl. 72-114.000.
Underwood, Donald L.: *See—*
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Union Carbide Corporation: *See—*
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Agriculture: *See—*
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Levenson, Elliott R., 3,933,615.
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United States Steel Corporation: *See—*
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Uno, Motohiko; Noma, Shigeaki; Ujiie, Hideo; Masui, Kazuo; and Kanesa, Tadashi, to Yanmar Diesel Engine, Co., Ltd. Load follow-up device for internal combustion engine equipped with supercharger. 3,933,137, Cl. 123-119.0CE.

Upjohn Company, The: *See—*
Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased, 3,933,794.
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Uralli, Samil S.; and Huff, Lemuel, to Johns-Manville Corporation. Apparatus for vibrating bulk material within a bin or tank. 3,933,281, Cl. 222-200.000.

Uram, Robert, to Westinghouse Electric Corporation. System and method for operating a steam turbine with improved organization of logic and other functions in a sampled data control. 3,934,128, Cl. 235-151.210.

Urayama, Kiyoshi, to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Screening apparatus. 3,933,648, Cl. 210-355.000.

Uskokovic, Milan Radoje: *See—*
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Utunomiya, Takeo: *See—*
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Valentin, Hans Wilhelm; Schmeiser, Kurt; and Beuth, Paul, to Hoechst Aktiengesellschaft. Volumetric determination of contaminated liquid or gaseous media. 3,933,038, Cl. 73-194.00R.

Valentine, Alastair; and Dennison, Richard L., to Minnesota Mining and Manufacturing Company. High voltage DC coupled amplifier. 3,934,209, Cl. 330-18.000.

Vanaglash, John J., Jr., to Burr-Brown Research Corporation. Novel encapsulating material and method. 3,933,712, Cl. 260-29.1SB.

van den Broek, William A., to KDI-Sylvan Pools, Inc. Combined liquid filtering and heating apparatus. 3,933,129, Cl. 122-156.000.

van der Heijde, Martin Clemens: *See—*
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van der Wal, David Josephus; and Grotepas, Frans, to U.S. Philips Corporation. Generator for producing tones of a musical scale in an electronic musical instrument. 3,933,072, Cl. 84-1.010.

Vandesande, Georges: *See—*
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, 3,933,992.

Van Engeland, Jozef Leonard; De Volder, Noel Jozef; and Timmerman, Daniel Maurice, to AGFA-GEVAERT N.V. Manufacture of an electrostatic toner material. 3,933,665, Cl. 252-62.10P.

Van Esbroeck, Jan: *See—*
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Van Leeuwen, Johannes Aloysius: *See—*
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Varani, Frederick T., to Bio-Gas of Colorado, Inc. Method and apparatus for the anaerobic digestion of decomposable organic materials. 3,933,628, Cl. 210-12.000.

Vargas, Rudolph, Jr., to Xerox Corporation. Apparatus for automatically regulating the amount of charge applied to an insulating surface. 3,934,141, Cl. 250-325.000.

Varian Associates: *See—*
Enck, Richard S., Jr.; and Sackinger, James P., 3,934,170.
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VCA Corporation: *See—*
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Veeder, George T., III: *See—*
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Velcon Filters, Inc.: *See—*
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Veldman, Adrian, to Wildwood Farm Services International Inc. Bedding retainer. 3,933,125, Cl. 119-28.000.

Velsicol Chemical Corporation: *See—*
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Ventron Corporation: *See—*
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Vetco Offshore Industries, Inc.: *See—*
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Viable Systems, Inc.: *See—*
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Victor Company of Japan, Limited: *See—*
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Vinet, Herbert Paul. Automatic workshop installation. 3,933,231, Cl. 194-1.00R.

Vineyard, Billy D.: *See—*
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Viola, James J.: *See—*
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Vissers, Donald R.; and Tani, Benjamin S., to United States of America, Energy Research and Development Administration. Anode for a secondary, high-temperature electrochemical cell. 3,933,521, Cl. 136-6.0LF.

Vivian, Thomas A., to Dow Chemical Company, The. Compositions for reflowing organic surfaces. 3,933,517, Cl. 106-311.000.

Vivian, Thomas A., to Dow Chemical Company, The. Compositions for reflowing organic surfaces. 3,933,518, Cl. 106-311.000.

Vock, Manfred Hugo: *See—*
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Vogeler, William K.; and Shorter, Donald E., to Telcom, Inc. Reliable cycle selection in LORAN-C system. 3,934,254, Cl. 343-103.000.

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Volat, Jean-Pierre; Berthoud, Fernand; and Berthoud, Guy, to Berthoud, S.A. Method and device for controlling fluid pressure. 3,933,277, Cl. 222-178.000.

Volnakov, Vladimir Alexandrovich: *See—*
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Von Borcke, Ulrich, to Siemens Aktiengesellschaft. Arrangement for the production of electrical signals by way of semiconductor components which are dependent upon a magnetic field. 3,934,160, Cl. 307-309.000.

von Bose, Robert J.; and Dial, Darrell D., to Oil States Rubber Company. Dock bumper unit. 3,933,111, Cl. 114-219.000.

von Konig, Anita; Kampfer, Helmut; Brinckmann, Eric Maria; and Heugebaert, Frans Clement, to AGFA-Gevaert, A.G. Photographic light-sensitive and heat developable material. 3,933,507, Cl. 96-114.100.

Von Saspe, Henry Carl, to New Products Corporation. Apparatus for screen printing bottles. 3,933,091, Cl. 101-40.000.

Vornberger, Walter, to International Shoe Machine Corporation. Roughing machine. 3,932,907, Cl. 12-1.00R.

Vrieland, G. Edwin; and Friedli, Hans R., to Dow Chemical Company, The. Method of oxydehydrogenation of ethyl benzene. 3,933,932, Cl. 260-669.00R.

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Wagner, Kuno, to Bayer Aktiengesellschaft. Process of preparation of synthetic resins by reacting a cross-linked isocyanate polyaddition product with low molecular weight polyisocyanate followed by reaction with an amino alkyl silane. 3,933,756, Cl. 260-75.0NE.

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Wakefield, Gene Felix; and Setty, H. S. Nagaraja, to Texas Instruments Incorporated. Tin-lead purification of silicon. 3,933,981, Cl. 423-348.000.

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Walstra, Hidde, to Texas Instruments Incorporated. Liquid level sensing switch. 3,934,103, Cl. 200-84.00C.

Walters, Andrew C.; and Goss, William M., to Fabco, Incorporated. Wedge actuated cutting and/or forming tools. 3,933,070, Cl. 83-529.000.

Walters, Wally Z., to Preco Corporation. Electrostatic reproduction process employing novel transfer paper. 3,933,489, Cl. 96-1.400.

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Ward, Benjamin F., to Westvaco Corporation. High solids soaps of fatty acids and fatty oil derived polycarboxylic acids. 3,933,780, Cl. 260-97.500.

Ward, Frank L., to Clarostat Mfg. Co., Inc. Magnetic detent device. 3,934,216, Cl. 335-272.000.

Wardell, Peter S.: *See—*
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Watanabe, Tetsuo, to Dai Nippon Printing Company Limited. Process for manufacturing a body of moisture-proof container for packaging. 3,933,559, Cl. 156-211.000.

Watarai, Syu: *See—*
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Watson, James M., to Cosden Technology, Inc. Nitrosyl chloride as a polymerization inhibitor for vinyl aromatic compounds. 3,933,599, Cl. 203-9.000.

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Weichselbaum, Theodore E.; and Gusky, William W., to Sherwood Medical Industries Inc. Process of manufacturing a porous, stainless steel filter element and sealing it in a tubular fitting, and resulting filter. 3,933,652, Cl. 210-446.000.

Weigert, Hans, to Ragen Precision Industries, Inc. Analog display utilizing liquid crystal material and for being multiplexed wherein one group of electrodes are arranged opposite a group of counter-electrodes. 3,934,241, Cl. 340-324.00R.

Weisenbach, Charles O.; and Schneckenburger, Donald R., to General Signal Corporation. Variable displacement cylindrical pump. 3,933,083, Cl. 92-12.200.

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Weissman, Bernard. Pin arrangement for prosthodontic casts. 3,932,939, Cl. 32-2.000.

Weitzel, William H.; and La Grange, Lee D., to Gulf Oil Corporation. Uniform microspheroidal particle generating method. 3,933,679, Cl. 252-301.10S.

Wellekens, John F. Lock mechanism. 3,933,380, Cl. 292-175.000.

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Wells, William Neil, to Avon Rubber Company Limited. Wheel rim. 3,933,392, Cl. 301-98.000.

Welsh, Jay Y., to Diamond Shamrock Corporation. Direct cooling of reduced manganese ore. 3,932,945, Cl. 34-20.000.

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Wood, Kenneth E.; O'Farrell, James T.; Parrish, William F.; and Roesler, Gordon M., to Westinghouse Electric Corporation. Viewing system. 3,934,077, Cl. 178-6.000.

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Wright, John Thomas Matthew, to National Research Development Corporation. Prosthetic heart valve separately formed cage. 3,932,898, Cl. 3-1.500.

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Dudko, Daniil Andreevich; Samsonov, Grigory Valentinovich; Maximovich, Boleslav Ivanovich; Zelenin, Vitaly Ivanovich; Klimanov, Alexandr Sergeevich; Potseluiko, Vladimir Nikolaevich; Trunov, Gennady Vasilievich; and Sleptsov, Vasily Mikhailovich, 3,933,482.
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Zink, John S.; Schwartz, Robert E.; and Reed, Robert D. Vertically fired burner for waste combustible gases. 3,933,420, Cl. 431-202.000.
Zinoviev, Alexandr Fedorovich; Korotkevich, Boris Sergeevich; Petukhov, Sergei Timofeevich; Basiev, Izmail Mikhailovich; Shmuk, Jury Alexandrovich; Mamedov, Ulchar Ashraf ogly; Poznyak, Ilya Yakovlevich; Starominsky, Naum Mikhailovich; Shmarovoz, Nikolai Pavlovich; Volnakov, Vladimir Alexandrovich; Minaev, Viktor Georgievich; and Strukov, Alexei Semenovich. Method of and device for isolation of rubber-like polymers from hydrocarbon solutions. 3,933,574, Cl. 159-16.00S.
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B 24,017	3,914,140	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,603	3,915,571	Oct. 28, 1975
B 288,018	3,925,239	Dec. 9, 1975	B 321,018	3,921,623	Nov. 25, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 321,101	3,917,163	Nov. 4, 1975
B 288,638	3,925,132	Dec. 9, 1975	B 321,938	3,923,889	Dec. 2, 1975
B 289,175	3,924,309	Dec. 9, 1975	B 322,182	3,925,390	Dec. 9, 1975

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B 322,239	3,920,973	Nov. 18, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 358,174	3,924,958	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 363,205	3,923,744	Dec. 2, 1975
B 346,487	3,927,406	Dec. 16, 1975	B 363,337	3,928,639	Dec. 23, 1975
B 346,585	3,913,820	Oct. 21, 1975	B 363,457	3,922,595	Nov. 25, 1975
B 346,613	3,923,545	Dec. 2, 1975	B 363,674	3,929,716	Dec. 30, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 363,892	3,913,395	Oct. 21, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 387,687	3,918,151	Nov. 11, 1975	B 411,483	3,925,196	Dec. 9, 1975
B 387,761	3,914,245	Oct. 21, 1975	B 411,633	3,914,741	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JANUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American District Telegraph Company: *See*—
Highstone, Raymond J., deceased; and Muehter, Manfred W., Re. 28,692.

Baile, Clifton A.; Gallagher, Gregory; McLaughlen, Carol L.; and Webb, Robert Lee, to SmithKline Corporation. Methods and compositions for increasing feed intake of animals using tertiary alcohols. Re. 28,691, Cl. 424-343.000.

Carding Specialists (Canada) Limited: *See*—
Varga, Andre, Re. 28,685.

Cook, Paul M., to Raychem Corporation. Solid heat-flowable dispersed phase in a crosslinked elastomer. Re. 28,688, Cl. 260-4.000.

Coulthard, John. Measurement of fluid flow rates. Re. 28,686, Cl. 73-194.00E.

Doi, Tetsuo; and Sagae, Shoji, to Hiatchi, Ltd. Image transfer recording apparatus with resin coated drum. Re. 28,693, Cl. 346-74.0ES.

Gallagher, Gregory: *See*—
Baile, Clifton A.; Gallagher, Gregory; McLaughlen, Carol L.; and Webb, Robert Lee, Re. 28,691.

Gibian, Heinz: *See*—
Lehmann, Hans-Gunter; Gibian, Heinz; Wiechert, Rudolf; and Neumann, Friedmund, Re. 28,690.

Hiatchi, Ltd.: *See*—
Doi, Tetsuo; and Sagae, Shoji, Re. 28,693.

Highstone, Raymond J., deceased; and Muehter, Manfred W., to American District Telegraph Company. Monitoring apparatus and method for electrical protection systems. Re. 28,692, Cl. 340-276.000.

Ideal Industries, Inc.: *See*—
Metcalf, Irving R., Re. 28,687.

Kataoka, Hiroshi, to Overhead Door Corporation. Apparatus for automatically connecting shutter slat and preventing its disengagement. Re. 28,684, Cl. 29-208.00D.

Lehmann, Hans-Gunter; Gibian, Heinz; Wiechert, Rudolf; and Neumann, Friedmund, to Schering Aktiengesellschaft. 17α-Ethinyl-18-methyl-19-nortestosterone esters. Re. 28,690, Cl. 424-238.000.

McLaughlen, Carol L.: *See*—
Baile, Clifton A.; Gallagher, Gregory; McLaughlen, Carol L.; and Webb, Robert Lee, Re. 28,691.

Metcalf, Irving R., to Ideal Industries, Inc. Wire stripper. Re. 28,687, Cl. 81-9.50A.

Muehter, Manfred W.: *See*—
Highstone, Raymond J., deceased; and Muehter, Manfred W., Re. 28,692.

Neumann, Friedmund: *See*—
Lehmann, Hans-Gunter; Gibian, Heinz; Wiechert, Rudolf; and Neumann, Friedmund, Re. 28,690.

Overhead Door Corporation: *See*—
Kataoka, Hiroshi, Re. 28,684.

Raychem Corporation: *See*—
Cook, Paul M., Re. 28,688.

Sagae, Shoji: *See*—
Doi, Tetsuo; and Sagae, Shoji, Re. 28,693.

Schering Aktiengesellschaft: *See*—
Lehmann, Hans-Gunter; Gibian, Heinz; Wiechert, Rudolf; and Neumann, Friedmund, Re. 28,690.

SmithKline Corporation: *See*—
Baile, Clifton A.; Gallagher, Gregory; McLaughlen, Carol L.; and Webb, Robert Lee, Re. 28,691.

Turner, Lloyd S. Method of molding a building structure by spraying a foamed plastic on the inside of an inflatable form. Re. 28,689, Cl. 264-46.600.

Varga, Andre, to Carding Specialists (Canada) Limited. Method and apparatus for the treatment of cotton fibres. Re. 28,685, Cl. 57-156.000.

Webb, Robert Lee: *See*—
Baile, Clifton A.; Gallagher, Gregory; McLaughlen, Carol L.; and Webb, Robert Lee, Re. 28,691.

Wiechert, Rudolf: *See*—
Lehmann, Hans-Gunter; Gibian, Heinz; Wiechert, Rudolf; and Neumann, Friedmund, Re. 28,690.

LIST OF PLANT PATENTEES

Jackson & Perkins Co.: *See*—
Tantau, Mathias, 3,824.
Warringer, William A, Rose plant. 3,825, 1–20–76, Cl. 26.

LIST OF DESIGN PATENTEES

Adams, Peter D., and W. R. Lauper, to Quadrastat Controls Corp. Panel supported transmission shift control module for mobile or stationary equipment. 238,508, 1–20–76, Cl. D55—1.

Amerock Corp.: *See*—
Clayton, Laverne C. 238,478.

Ampex Corp.: *See*—
Staley, Darrell S. 238,491.

Anchor Hocking Corp.: *See*—
Thrush, James L. 238,502.

Armstrong Store Fixture Corp.: *See*—
Moore, David M, 238,472.

Artaud, Maurice H., to Stromberg-Datagraphix, Inc. Computer output microfilmer. 238,514, 1–20–76, Cl. D61—1.

Baldwin, Charles D., to Toucon Mfg. Inc. Quadricycle. 238,485, 1–20–76, Cl. D12—107.

Barr, Katie H. Pet house. 238,498, 1–20–76, Cl. D30—1.

Bauman, Arthur E. Toilet tissue holder. 238,459, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,460, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,461, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,462, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,463, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,464, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,465, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,466, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,467, 1–20–76, Cl. D6—97.

Bauman, Arthur E. Toilet tissue holder. 238,468, 1–20–76, Cl. D6—97.

Baumgartner Papiers S.A.: *See*—
Ducommun, Joel D. 238,481.

Bausch & Lomb Inc.: *See*—
Van Exel, Gerrit A. 238,513.

Bittner, John R.: *See*—
Fossella, Gregory, Bittner, and McCartney. 238,497.

Blitch, William E., to The Webline Corp. Shower splash guard. 238,490, 1–20–76, Cl. D23—69.

Blomquist, Jay L. Display stand for eye glasses or the like. 238,457, 1–20–76, Cl. D6—24.

Boldt, Melvin H., to Zenith Radio Corp. Television receiver. 238,511, 1–20–76, Cl. D56—4.

Boldt, Melvin H., to Zenith Radio Corp. Television receiver. 238,512, 1–20–76, Cl. D56—4.

Bordas, Paul M.: *See*—
Brown, Gene T., and Bordas. 238,496.

Burroughs Corp.: *See*—
Clayton, Richard G. 238,492.

Candler, Robert A. Skate coaster. 238,500, 1–20–76, Cl. D34—15.

Cavallero Adrian, Mario. Armchair. 238,458, 1–20–76, Cl. D6—67.

Clayton, Laverne C., to Amerock Corp. Pull. 238,478, 1–20–76, Cl. D8—173.

Clayton, Richard G., to Burroughs Corp. Console for a data system. 238,492, 1–20–76, Cl. D26—5.

Colgate-Palmolive Co.: *See*—
Hendrickson, Thomas C. 238,518.

Dominion Auto Accessories Lt.: *See*—
Nagel, Robert I. 238,505.

Dow, Charles H., H. E. Johnson, and C. D. Shaw, Jr. Can opener. 238,477. 1–20–76, Cl. D8—40.

Ducommun, Joel D., to Baumgartner Papiers S.A. Instrument case for poromieter. 238,481, 1–20–76. Cl. D10—46.
Finnegan, William. Covered food dish. 238,473, 1–20–76, Cl. D7—5.
Fossella, Gregary, J. R. Bittner, and K. C. McCartney, to General Electric Co. Cabinet for an input-output device for a data handling system. 238,497, 1–20–76, Cl. D26—5.
Gaeddert, Malvin V., and B. D. McWhirt, to Hesston Corp. Round bale forming machine. 238,501, 1–20–76, Cl. D40—1.
General Electric Co.: *See*—
Fossella, Gregory, Bittner, and McCartney. 238,497.
General Gas Light Co.: *See*—
Loveless, Stanley M. 238,503.
Loveless, Stanley M. 238,506.
Great American Resources Inc.: *See*—
Prochnow Lee W. 238,499.
Heen, Kaare. Hydraulically driven tool for compressing helical springs. 238,507, 1–20–76, Cl. D54—13.
Hendrickson, Thomas C., to Colgate-Palmolive Co. Plastic sheet material. 238,518, 1–20–76, Cl. D87—3.
Hesston Corp.: *See*—
Gaeddert, Malvin V., and McWhirt. 238,501.
Hjelmquist, Stig G. Container for table-tennis bat. 238,480, 1–20–76, Cl. D9—192.
Johnson, Harold E.: *See*—
Dow, Charles H., Johnson, and Shaw. 238,477.
Kalvitis, Robert E., and D. A. Robertson, to Xerox Corp. Control panel for disk file. 238,494, 1–20–76, Cl. D26—5.
Kalvitis, Robert E., and D. A. Robertson, to Xerox Corp. Disk memory module front panel. 238,495, 1–20–76, Cl. D26—5.
Kimberly-Clark Corp.: *See*—
Lanius, Charles A. 238,469.
Kornylak Corp.: *See*—
Tabler, Charles P. 238,510.
Landesman, Eugene, to Lawson Printing Machine Co., Inc. Silk screen printing machine. 238,515, 1–20–76, Cl. D64—11.
Lanius, Charles A., to Kimberly-Clark Corp. Dispensing container for tissues. 238,469, 1–20–76, Cl. D6—98.
Lauper, Warner R.: *See*—
Adams, Peter D., and Lauper. 238,508.
Lawson Printing Machine Co., Inc.: *See*—
Landesman, Eugene. 238,515.
Logue, Leland H. Tray. 238,474, 1–20–76. Cl. D7—20.
Logue, Leland H. Tray. 238,475, 1–20–76, Cl. D7—20.
Iogue, Leland H. Tray. 238,476, 1–20–76, Cl. D7—20.
Loveless, Stanley M., to General Gas Light Co. Gas light. 238,503, 1–20–76, Cl. D48—4.
Loveless, Stanley M., to General Gas Light Co. Gas light cluster. 238,506, 1–20–76, Cl. D48—23.
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CLASS 330

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68 3,934,004
78 3,934,005
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177 3,934,008
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251 3,934,014
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320 3,934,029
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645 3,934,050
652 3,934,051
659 3,934,052
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185 3,934,062
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	67	238,458		98	238,469		192	238,480	D26—	5C	238,491	D40—	1E	238,501	D56—	4D	238,511
	97	238,459		162	238,470	D10—	46	238,481			238,492	D48—	2	238,502			238,512
		238,460		172	238,471		106	238,484			238,493		4B	238,503	D57—	1E	238,513
		238,461		193	238,472	D12—	54	238,482			238,494		20J	238,504	D61—	Q	238,514
		238,462	D7—	5	238,473		78	238,483			238,495		23R	238,506	D64—	11R	238,515
		238,463		20	238,474		107	238,485			238,497		32A	238,505	D73—	1B	238,516
		238,464			238,475		143	238,486		14G	238,496	D54—	13R	238,507	D83—	F	238,517
		238,465			238,476		146	238,487	D30—	1	238,498	D55—	1C	238,510	D87—	3G	238,518
		238,466	D8—	40	238,477		155	238,488	D34—	5GH	238,499		E	238,509	D95—	A	238,519
		238,467		173	238,478		167	238,489									

Classification of Plants

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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4 : 3,932,909	3,933,281	3,934,149	3,933,663	3,933,206	3,933,912
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6 : Re.28,688	3,933,448	3,934,248	11 : 3,933,410	3,933,520	3,934,044
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